Industrial Hygiene Section

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Industrial Health, Occupational Diseases and Traumatic Surgery

January, 1943

Carbon Tetrachloride
— In Industrial Hygiene —

Dental Ill-Health
— In Relation to Absenteeism —

Low Back Pain
— Some Anatomical Considerations —

Toxicity of Gallium
— An Exploratory Investigation —

A Health Program
— In Terms of Results —

Pneumoconiosis
— Among Mica and Pegmatite Workers —

Keep War Workers Well
— Industrial Hygiene Foundation Meeting —

Industry, The War
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Industrial Nursing Personnel
— Essential for Maximum War Effort —

Acute and Chronic Toxicity
— Public Health Aspects —

Hygienic Disposal
— of Collected Dusts —

Industrial Hygiene Meetings
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Volume 12 Number 1

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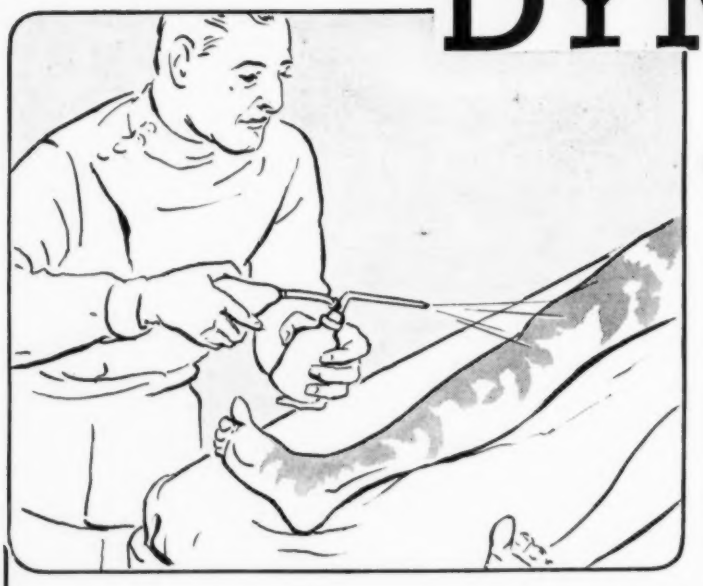

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*Palmer, E. P. and Palmer, E. P. Jr., Southwestern Med. Jl. *26:* 251 (Aug.) 1942.

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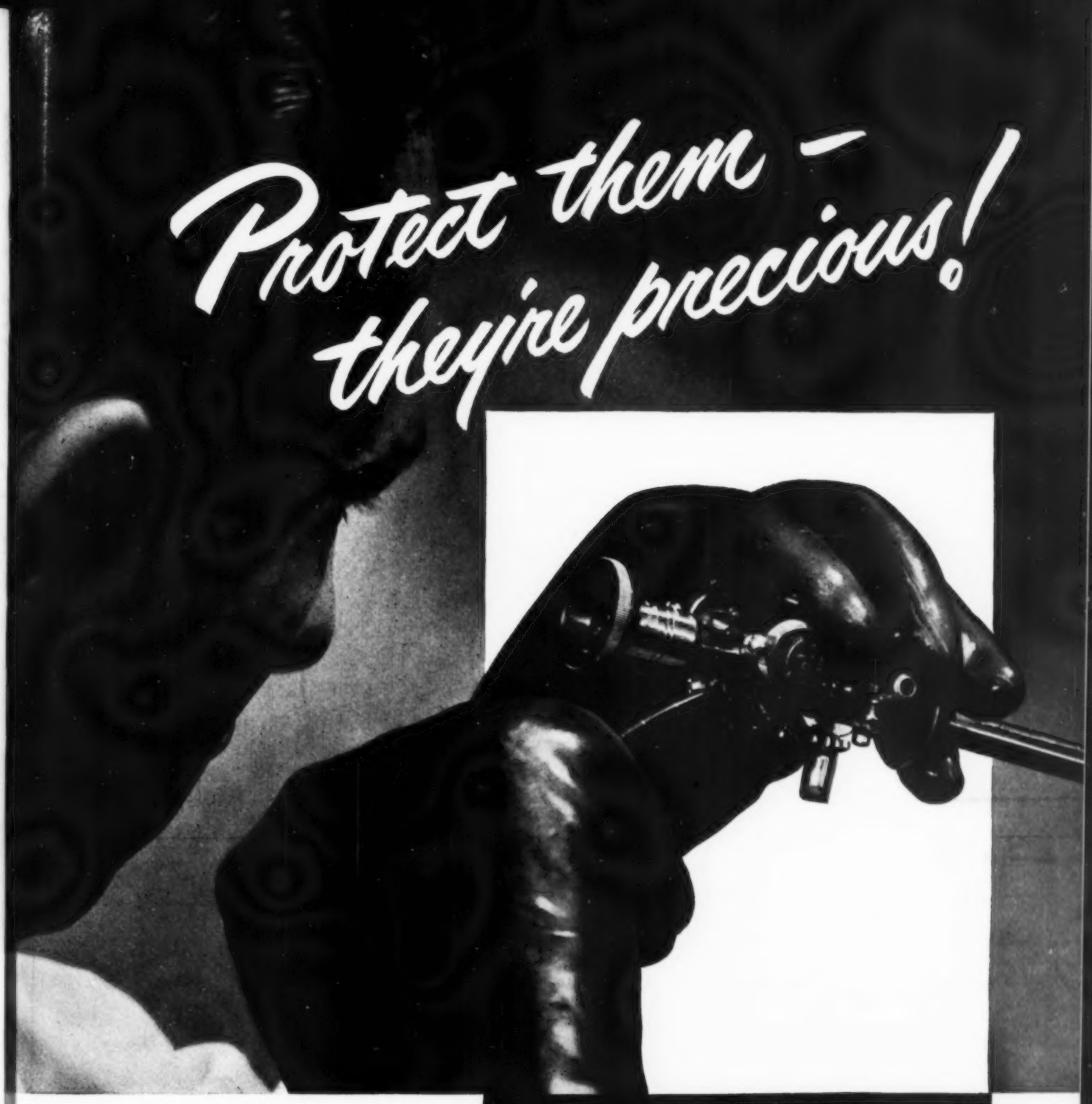

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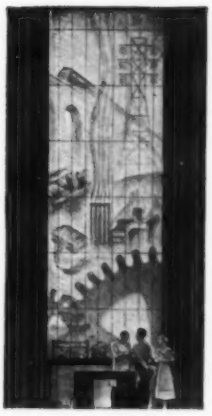

INDUSTRIAL HYGIENE
INDUSTRIAL MEDICINE
& RAILROAD SURGERY

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KEYNOTE of this issue—if it needs one—might be "Not to interest the industrial physician less but the industrial hygienist more." There is much for both in these pages, selected with the thought in mind that the sum total of their combined skills and sciences is expressed in industrial health, in so far as "health" can be achieved in industry. . . . THE news items, comments and opinions run the gamut, touching on many things. DR. HEIMAN'S remark, at the end of "Mass Hysteria" (p. 38), that "this has happened on other occasions elsewhere" recalls the Detroit incident some months ago in which a girl fell in a faint and within a few minutes 33 others had done the same thing. Prompt investigation found no physical or environmental reason. The editorial (p. 53) is pertinent. One item of news omitted—it is now so widely known that it is no longer news—is that the fifth annual Congress on Industrial Health convenes this month at the Palmer House, Chicago, with a whale of a program. . . . DR. EASTON'S careful summary on "Carbon Tetrachloride" (p. 1) has a well timed usefulness in many places. . . . DR. HOOPER'S first discussion of the relation between dental ill-health and employee absenteeism appeared in INDUSTRIAL MEDICINE for April, 1942. He is too modest to believe that he was the Wyclif of a dental-service-in-industry Renaissance, but the fact is that action has begun. Here (p. 3) he is again ahead of his time, with a plea for complete dental x-rays as a "must" part of every pre-employment physical examination. May action follow as quickly from his second article as it seems to have followed from his first (p. 31) . . . DR. SCHNITKER'S "Low Back Pain" (p. 5) has all the elements of as much helpfulness as he modestly intends. . . . A MEDICAL dictionary says of gallium "some of its compounds are

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poisonous." But "nobody apparently has ever done any industrial toxicologic work with gallium," although this rare metal, along with most of the others rare and little known, is coming into increased usefulness. The study by DRS. MEEK, HARROLD and MCCORD (p. 7) is another "first" to their credit. . . . DR. WITTMER'S "Health Program" (p. 9) is one more of the excellent lectures from Long Island College of Medicine's first Post-Graduate Course in Industrial Medicine, in November. We say "first" because the Course is likely to be repeated this spring. It was so good an education that all its "students" testify to its value, an increasing number by their ability to assume and handle important positions in industrial medical work. . . . DR. BURNELL claims no credit for the selection of America's "Miss Victory" from among the employees in his medical charge; but the fact remains that no "Miss Victory" could emerge from an unhealthy place of work. . . . DRS. VESTAL, WINSTEAD and JOLIET contribute an important addition to the sum of knowledge on the effects of dust inhalations, with special reference to mica. . . . "KEEP WAR WORKERS WELL," abstracting Industrial Hygiene Foundation's last annual meeting, begins and ends with "Manpower." This report is long, but it is a treatise on applied industrial medicine; the 20 subjects abstracted, some new, all interesting, relate to improving the objective environment and the subjective efficiency of that same manpower. . . . DR. KUH (p. 34) only lately became Chief of California's Bureau of Industrial Health. His grasp of his new situation, evidenced in his "Industry, the War, and Tuberculosis" (p. 34), is quick and thorough, bespeaking the fine teamwork of interest and ability. . . . DR. FITZGIBBON analyzes "The Kaiser Medical Problem" (p. 42) so clearly as to dispose of all reasons for misunderstanding. His discussion leaves no doubt that the matter is being ably handled. . . . THE psychology of the "Employee Manual," as described by MR. NEWMAN (p. 50), has advanced a long way from that of the company rule book we saw years ago and never forgot, in which the matter of safety was disposed of in these words: "Unsafe practices will not be tolerated". . . . IN publishing the study of duties performed by industrial nurses (pp. 48, 49), the N.O.P.H.N. is not suggesting the withdrawal of experienced nurses who are actually needed in industry (rather it recommends considerably more service to small plants than is being used), but it is urging industrial managers and medical directors to weigh carefully the conservation of nursing service, to the end that as many as possible, who are qualified, be made available for the armed forces. In one plant, of 2000 workers, 12 nurses are employed; one graduated 10 years ago, one three years ago, while 10 finished their training within the past 15 months. In another plant, of 8000 workers, 14 nurses are doing a bang-up job, on a three-shift basis. . . . ON the Nutrition Front, a letter from Allis-Chalmers, Milwaukee, says: "We are presently contemplating the expansion of our facilities for serving food in our shops". . . . THE production front has its casualty lists, too. And once in a while a name burns there in the searing letters that spell a good friend gone. It is difficult to realize that DON CUMMINGS has been taken away, doubly difficult for those who see the abstract (p. 64) of his talk at the St. Louis meeting of the A.P.H.A. and remember that so short a time ago they heard him give it. . . . THE St. Louis A.P.H.A. meetings were about as usual technically, but there was something else present at every session. After a little thought on the reasons for the key in which some of the proceedings seemed to be pitched, one suddenly waked up to the fact that the War, with all that it involves, was not only in this country, but also right there in St. Louis. . . . FOR the first time in A.P.H.A. experience there was at St. Louis full and unequivocal recognition of the fact, repeatedly expressed, that need exists for the training of industrial medical personnel — the doctor, the nurse, the industrial hygienist, and all of those whose cooperation is so vital in the conduct of every good medical department. . . . WHY not a study of the supply of industrial hygienists, a pool survey, as it were, similar to the one being made for nurses? . . .

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THE object of this Association shall be to foster the study and discussion of the problems peculiar to the practice of industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes and results of the medical care of employees, and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for their mutual advancement in the practice of their profession.

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DR. SIDNEY M. McCURDY, formerly supervisor of the Medical Section of the State Industrial Commission of Ohio, is medical director of the Plum Brook Ordnance Plant, at Sandusky, Ohio. DR. WALTER K. STEWART, formerly of Youngstown, is assistant medical director.

DR. FREDERICK W. SLOBE, First Vice-President of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, has been appointed Chairman of the Committee on Industrial Health of both the Chicago Medical Society and the Illinois State Medical Society.

DR. LLOYD M. FARNER, Nashville, Tennessee, U. S. Public Health Service, has been placed in charge of the new industrial hygiene division of the state department of health. Dr. Farner, who has been lent to the state by the public health service, organized and served as director of a similar division in Montana, and later as director of industrial hygiene in Tennessee.

MAJOR JOSEPH L. FETTERMAN, M.C. stationed at Walter Reed Hospital, Washington, D. C., has been selected as one of four physicians to teach in the Army School for Neuropsychiatry. This is a new project, affiliated with the Lawson General Hospital, Atlanta, Georgia. Army physicians will be sent to this school for a month's course of instruction, which will be largely clinical. The work of the teacher includes study and treatment of patients, lectures, instructions and clinical conferences.

DR. PHILIP H. KREUSCHER and DR. JOSEPH H. CHIVERS, both of Chicago, are Chairman and Vice-Chairman, respectively, of Illinois' first special advisory committee to the Division of Industrial Hygiene of the State Department of Public Health just appointed by Governor Dwight H. Green. The new committee will help to develop well-rounded state programs of adult hygiene, all the way from the control of hazardous working conditions to the care of pregnant women in war industries. DR. ROLAND R. CROSS, Illinois Director of Public Health, and DR. MILTON H. KRONENBERG, Chief of the Division of Industrial Hygiene, will serve as ex-officio members. Other Chicago Members are DR. RAYMOND B. ALLEN, of the University of Illinois, WILLIAM DONOVAN, HARRY GUILBERT, A. G. HEW-

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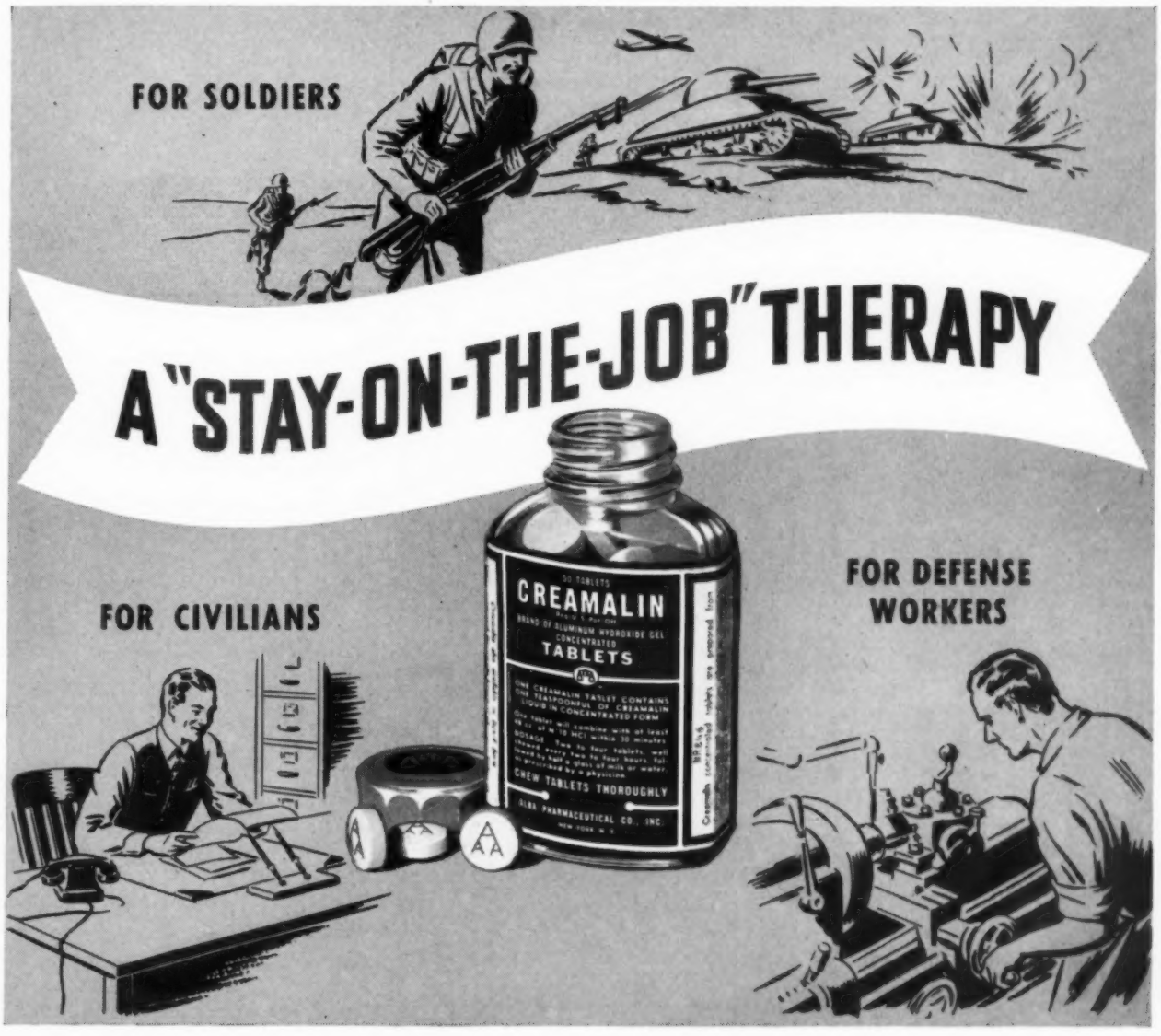

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DR. UDO J. WILE, professor of dermatology and syphilology in the University of Michigan Medical School, has been appointed medical director (R) in the U. S. Public Health Service for active duty with the Division of Venereal Disease Control. He will conduct a study of all new methods described in recent years by various clinicians for the intensive treatment of syphilis. He will also supervise the quarantine hospitals which the Public Health Service and the states are developing in a number of critical war areas.

DR. HAROLD H. BAKER, Rochester, New York, who established Bausch and Lomb's industrial hospital more than 35 years ago and has directed it continuously since, was given a microscope as a memento of his distinguished contributions to industrial medicine. The presentation was made at a gathering of more than 350 Bausch & Lomb foremen and supervisors, at the Rochester Club, on the anniversary of Pearl Harbor. Feature of the occasion was the talk by guest speaker Stanley Johnston, noted war correspondent, who was aboard the carrier Lexington when her great

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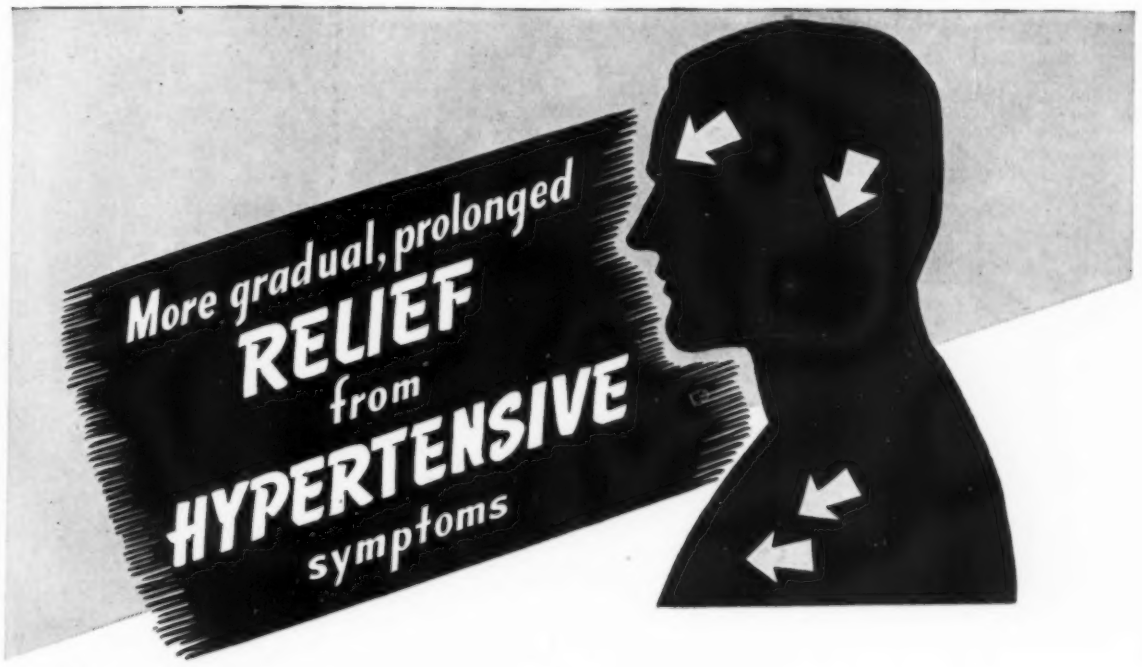

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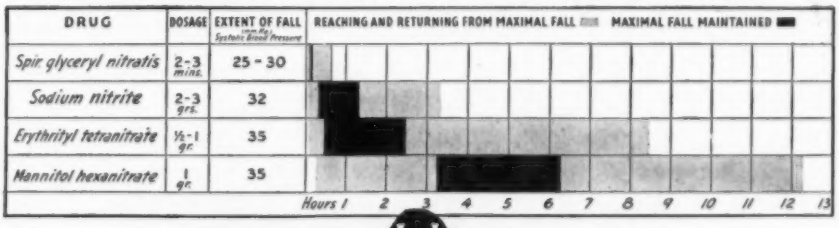

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career came to its end in the Coral Sea. DR. BAKER is retiring from active direction of the hospital and will be succeeded by DR. J. F. MCCAHAN, but will be retained as a consultant.

DR. DWIGHT W. ANDERSON, formerly of Lowell, Indiana, and lately in the health department of the Panama Canal Commission, has been appointed assistant in the medical department of Servel, Inc., Evansville, Indiana, of which DR. THOMAS DOBBINS is medical and safety director.

DR. FRED J. WAMPLER, Professor of Preventive and Industrial Medicine, Medical College of Virginia, Richmond, is editing a book on Industrial Medicine which is to be published in late February or early March, 1943, by the Williams & Wilkins Company, Baltimore.

DR. C. D. SELBY, medical consultant, General Motors Corporation, and LIEUT.-COL. A. J. LANZA (MC), Chief, Occupational Hygiene Branch, U. S. Army, together with NED H. DEARBORN, Executive Vice-President, National Safety Council, and PROF. PHILIP DRINKER, Harvard School of Public Health, are the new members of the Industrial Hygiene Foundation's Board of Trustees, elected at the November meeting. Among the Trustees re-elected are DR. R. R. SAYERS, Director, U. S. Bureau of Mines, and W. P. YANT, Director of Research, Mine Safety Appliances Company. DR. RAYMOND HUSSEY, of the State Industrial Accident Commission, Baltimore, Maryland, was named to the Foundation's Medical Committee.

DR. R. R. SAYERS, Director, U. S. Bureau of Mines, is the author of "Major Studies of Fatigue"—one of the most comprehensive analyses of this subject yet made. This text was prepared for the Industrial Hygiene Foundation, included in the proceedings of its 1941 annual meeting a year ago in November, and published in full in *War Medicine* for September, 1942. It is now available in reprint form, under A.M.A. copyright.

DR. LOUIS SCHWARTZ, medical director, U. S. Public Health Service, and DR. FRANK A. BARLOW, medical director, Wright Aeronautical Corporation, Paterson, New Jersey, have a study of "Chloracne From Cutting Oils" in *Public Health Reports* for November 20, 1942 (Vol.

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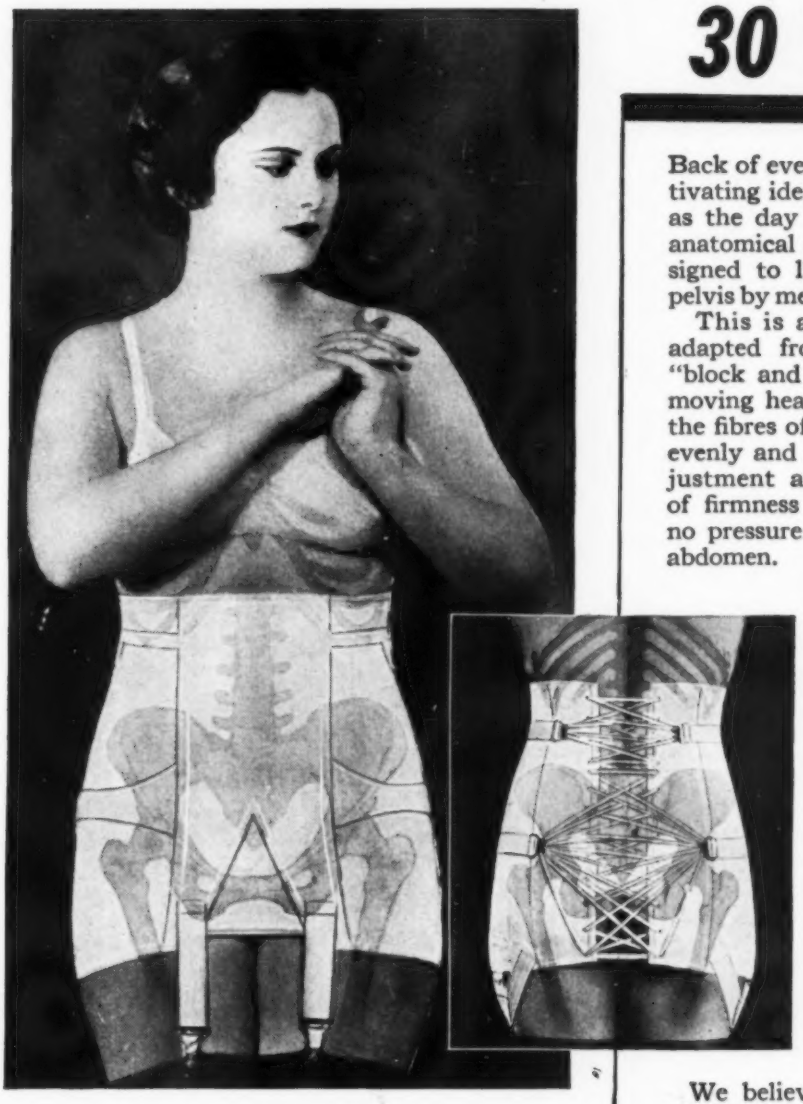

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57; No. 47). Examination of the medical records of a large motor factory showed that among about 20,000 employees there had been an average of over 100 cases of dermatitis per month for the preceding six months. Most of the cases were attributed to cutting oils, although varsol and the cores and molds for magnesium castings also caused a considerable percentage of the cases.

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

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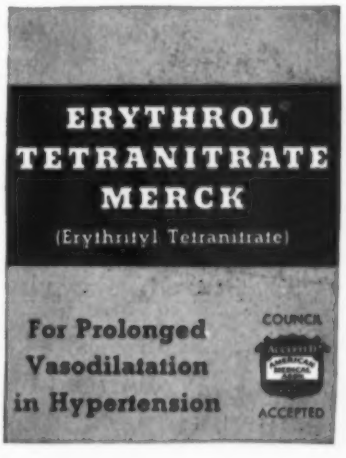
*"... hypertension usually is a serious disease which terminates the lives of those it afflicts within a relatively short period."**

*"About a fourth of all deaths of individuals past fifty years of age is referable to hypertension."**

*"It appears that the incidence of hypertension in the general population is increasing, but the evidence is not conclusive."**

*"The importance of hypertension as a problem of health needs emphasis. High blood pressure is both a common disease and a serious one. Indeed, it appears to be more common and more deadly than cancer."**

*"The mechanism by which blood pressure is elevated in essential hypertension is well known. There exists throughout the body an increased resistance offered to the flow of blood through arterioles."**



*Allen, E. V., Medical aspects of arterial hypertension, Bull. N. Y. Acad. Med. 17, March 1941

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Another Year of Research in

During the year 1942, the results of distinct research projects covering different phases of ERTRON therapy have been added to the extensive bibliographic background of this important therapeutic measure.**

STECK, I. E.: ***"Further Clinical Experience in the Treatment of Arthritis with Vitamin D," Ohio St. Med. Jl., 38:440-443, May, 1942.***

Steck reported on his clinical experience in 98 cases of arthritis treated with ERTRON and no concurrent medication.

These patients were observed over a period of years at the Arthritis Clinic, Research and Educational Hospitals, University of Illinois.

The therapeutic results were closely comparable with those previously reported from the same clinic. (Dreyer, I., and Reed, C. I.: "Treatment of arthritis with massive doses of Vitamin D," Arch. Phys. Ther., 16:537, 1935; Reed C. I., Struck, H. C. and Steck, I. E.: "Vitamin D: Chemistry, Physiology, Pharmacology, Pathology, Experimental and Clinical Investigations," University of Chicago Press, p. 389, 1939.)

In addition to the beneficial therapeutic effect of ERTRON, it is important to note that "there was no toxicity at any time among the 98 patients included in this report."

SNYDER, R. G., SQUIRES, W. H., FORSTER, J. W., TRAEGER, C. H. and WAGNER, L. C.: ***"Treatment of 200 Cases of Chronic Arthritis with Electrically Activated Vaporized Sterol (Ertron)," Indus. Med.: 11:295-316, July, 1942.***

The authors made a comprehensive study of 200 cases of chronic arthritis treated with ERTRON. Most of these patients had been treated previously by other methods at the same clinic (Arthritis Clinic, Hospital for Ruptured and Crippled, New York City) without success.

After extensive laboratory and clinical observations, the authors reported that "the medication used is a relatively non-toxic therapeutic agent. In our experience it has definite value as a method of treating chronic arthritis, especially of the rheumatoid type."

REYNOLDS, C.: ***"Comparative Therapeutic Value and Toxicity of Various Types of Vitamin D," Journal-Lancet, 62:372-375, Oct., 1942.***

Reynolds compared the therapeutic value and toxicity of various forms of Vitamin D, and concluded that "massive doses of irradiated ergosterol bring about the development of toxic effects without clinical improvement of arthritic patients, while use of the electric-discharge activated heat-vaporized ergosterol (Whittier Process) has consistently been followed by clinical improvement with frequent rehabilitation, and with negligible or no toxic manifestations even over prolonged periods of intensive treatment."

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****References:**

LIVINGSTON, S. K.: Vitamin D and Fever Therapy in Chronic Arthritis, Arch. Physical Therapy, X-Ray, Radium, Vol. XVII, pp. 704-706, November (1936).

FARLEY, ROGER T.: Management of Arthritis, Illinois Medical Journal, Vol. 71, pp. 74-77, January (1937).

FARLEY, ROGER T.: The Treatment of Arthritis with Massive Dosage Vitamin D, Jl. Am. Institute of Homeopathy, Vol. XXXI, pp. 405-409, July (1938).

REED, C. I., STRUCK, H. C. and STECK, I. E.: Vitamin D: Chemistry—Physiology—Pharmacology—Pathology—Experimental and Clinical Investigation, University of Chicago Press, p. 389 (1939).

FARLEY, ROGER T.: The Influence of Prolonged Administration of High Dosages of Vitamin D upon the Serum Calcium of Adults, Journal-Lancet, Minneapolis, Vol. LIX, No. 9, pp. 401-404, Sept. (1939).

VOLLMER, HERMAN: Treatment of Rickets and Tetany with a Single Massive Dose of Vitamin D, Jl. of Ped., pp. 491-501, April (1939).

FARLEY, ROGER T., SPIERLING, H. F. and KRAINES, S. H.: A Five-Year Study of Arthritic Patients, Ind. Med., pp. 341-352, August (1941).

WOLF, ISRAEL J.: Treatment of Rickets with a Single Massive Dose of Vitamin D, Jl. Med. Soc. of N. J., Vol. 38, p. 436, Sept. (1941).

KRAFKA, JOSEPH: Vitamin D Therapy in Psoriasis, Jl. Med. Assn. of Ga., Vol. XXX, No. 9, pp. 398-400, September (1941).

SNYDER, R. G. and SQUIRES, W. H.: A Preliminary Report on Activated Ergosterol, N. Y. State Jl. Med., pp. 708-719, May 1 (1940).

SNYDER, R. G., and SQUIRES, W. H.: Follow-up Study of Arthritic Patients Treated with Activated Vaporized Sterol, N. Y. State Jl., pp. 2332-2335, December (1941).

SNYDER, R. G., SQUIRES, W. H., FORSTER, J. W., TRAEGER, C. H. and WAGNER, L. C.: Treatment of 200 Cases of Chronic Arthritis with Electrically Activated Vaporized Sterol (Ertron)—Industrial Medicine, Vol. 11, No. 7, pp. 295-316, July (1942).

STECK, I. E.: Further Clinical Experience in the Treatment of Arthritis with Vitamin D, Ohio State Medical Journal, May (1942).

LEVINTHAL, DANIEL H. and LOGAN, C. E.: The Orthopedic and Medical Management of Arthritis, (In Press).

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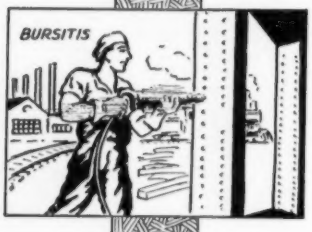

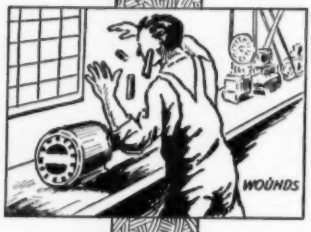

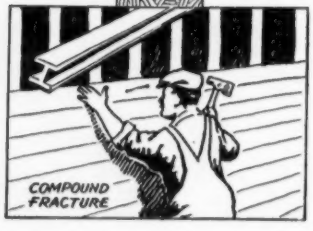

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*Koerber, Kenneth A., A.B., M.D., et al., Medical Department, Cramp Shipbuilding Co., Philadelphia: "Sulfallantoin in Industrial Medicine," INDUSTRIAL MEDICINE, October, 1942.

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NEW ENGLAND CONFERENCE OF INDUSTRIAL PHYSICIANS held its 1942 Annual Meeting at the University Club in Boston on December 4. The "very good attendance" heard an interesting talk by DR. HENRY MARBLE, after which there was a round-table discussion on problems of industrial medical importance. The officers and directors elected for the coming year are named in the Association column on page 12, herein.

WENDELL LUND, Director of the Labor Production Division, War Production Board, in a Pearl Harbor Anniversary Address at Dayton, Ohio, December 7, said that the anti-strike pledge of organized labor has resulted in an operation rate of better than 99% in war production industry so far as freedom from stoppages due to labor disputes is concerned. "It is high time that equally serious attention be paid to the twin enemies of illness and accident which operate within our borders, depriving us of hundreds of millions of man days urgently needed in war industry." He declared that the WPB Labor Production Division would soon launch a campaign among the "soldiers of production" to improve industrial health and safety.

SPEAKING of Ohio physicians and warfare, it is a little known historical fact that RICHARD JORDAN GATLING, M.D., an 1850 graduate of Ohio Medical College, was the inventor of the deadly repeating gun that bore his name. DR. GATLING, who eschewed the practice of medicine to devote full time to inventing, developed this crude forerunner of the modern machine gun in order to make warfare so deadly that man would cease waging it. At the time of his death in 1903 he confidently believed he had achieved his purpose and thus brought lasting benefit to humanity.
—*Ohio State M. J.*, December, 1942.

WANTED: Position by Virginia licensed physician, draft exempt. Prefer industrial or institutional practice. Able-bodied, single, experienced. Write "Doctor," care this journal.
—Adv. in *Virginia Med. Monthly*, Richmond, December, 1942.

GENERAL

INDUSTRIAL Hygiene Foundation's new bulletin, "Measuring Airflow in Industrial Ventilation," has just been published under the auspices of the Preventive Engineering Committee, and is being distributed to members.

NEW YORK Post-Graduate Medical School announces a course on industrial medicine, January 11-15, under the direction of DR. HARRY J. JOHNSON. The course will be conducted by physicians in industrial medical practice in cooperation with the faculty of the medical school. Additional information may be obtained by addressing the director of the New York Post-Graduate Medical School, 309 East 20th Street.

DR. HENRY A. WALTER, program chairman, announces a program on industrial health for the Lancaster County Medical Society at its January meeting. DR. JOSEPH SHILEN, director of the State Bureau of Industrial Hygiene, is speaking on "The Role of the State Health Department in War Industries."
—*Lancaster (Pa.) Intell. Journal.*

ASCORBIC ACID (vitamin C) has been placed under allocation control through the issuance by the Director General for Operations of General Preference Order M-269. Development of the use of vitamin C in food and medicinal production for the armed forces was the primary cause for the action, as production was formerly geared to meet pharmaceutical needs. Present production does not meet current estimated requirements, and, although production capacity is being increased, demands for 1943 will probably be more than double the 1942 figures.

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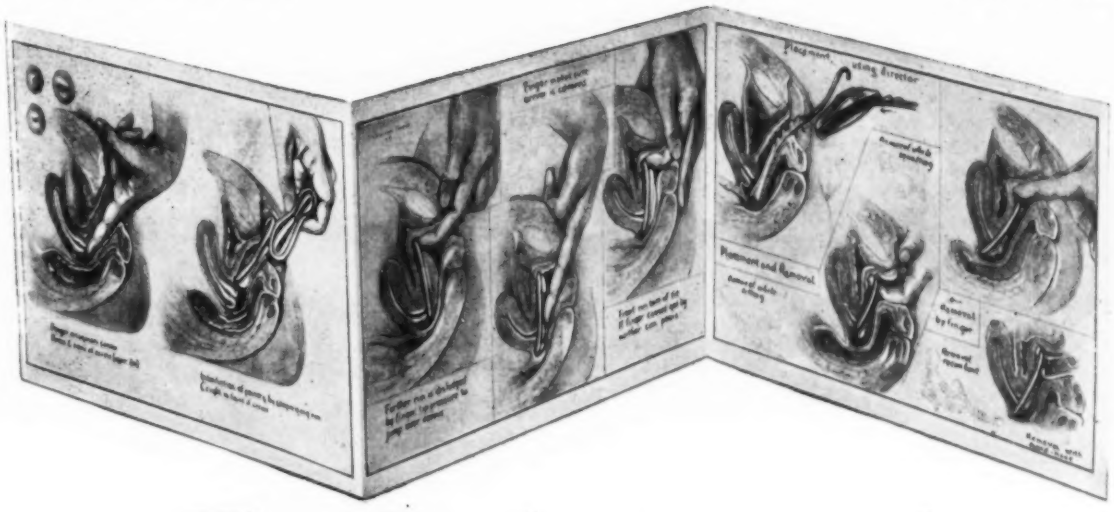

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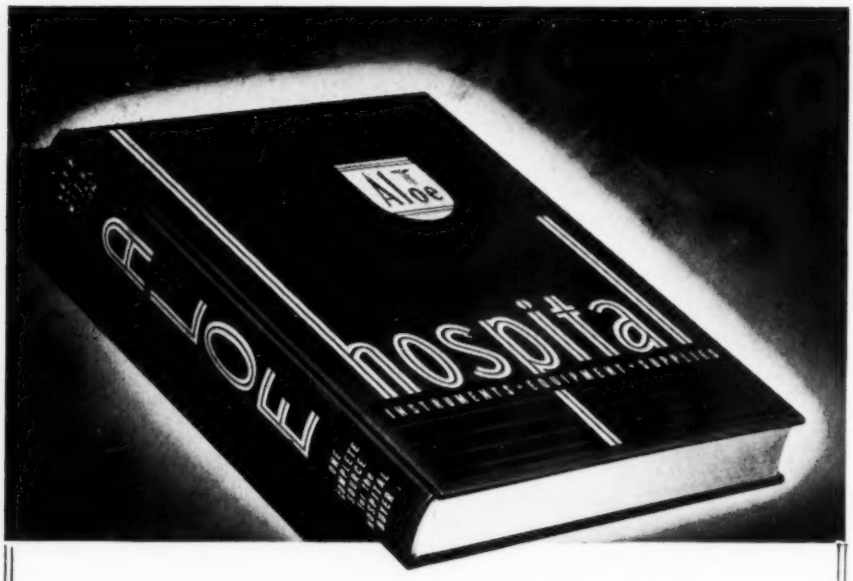

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Enough will be available, however, for essential civilian use. Vitamin C is used both by the armed forces and civilians in the prevention and treatment of scurvy, and other deficiency diseases caused by its lack. The Quartermaster Corps is using large quantities in "K" and "Jungle" rations, and there is also a substantial demand for Lend-Lease requirements. Sorbital, recently placed under allocation control, is one of the principal raw materials needed for the production of vitamin C.

DR. CHARLES-EDWARD A. WINSLOW, of the Yale Department of Public Health, at Yale School of Medicine's recent Industrial Health and Medical course: "The industrial physician should consider himself not merely as a repair man but as a health co-ordinator, who, with the industrial nurse and the community nurse, can establish contact between the worker and all the health and welfare agencies of the community."

CITY COUNCIL has rather unceremoniously refused an appropriation of $24,000 for a Division of *Industrial Hygiene* in 1943. Director of Public Health OWEN wanted the Division to check on health and safety hazards in the city's smaller industrial plants, particularly those which do not have their own medical departments. With industrial activity so greatly accelerated and so much crowding of people in transportation and housing facilities, and elsewhere, pleas for more intensive health protection have an initial plausibility that entitles them at least to thorough public discussion before a decision is made. Whatever other reason Councilmen may have had for rejecting this idea, the financial one would probably have seemed sufficient. Budget plans for 1943 leave little or no room to squeeze in any new functions. Latest figures of the Census Bureau on the health expenditures of cities are for 1939. They showed Philadelphia spending less per capita than any other city with a population of 500,000 or over.

—*Philadelphia (Pa.) Record.*

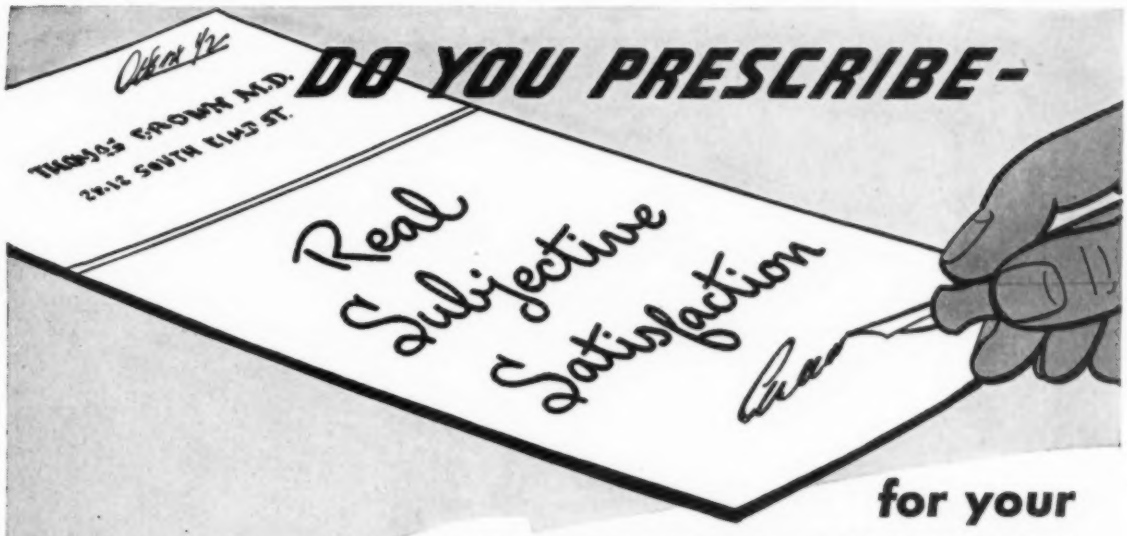
SILICA sand, which was replaced largely by steel shot or grit 10 years ago, is now being introduced as the result of steel shortages, and the hazard of silicosis in abrasive blasting operation is again in the foreground.

—J. J. BLOOMFIELD, in Tenth Lecture on Industrial Health and Medicine, Yale School of Medicine.

THE author has written to the medical departments of 22 of the largest users of grinding wheels. Eighteen replies were received. In no case was pneumoconiosis a problem and the incidence of tuberculosis was low. Several insurance companies which have extensive coverage of this hazard made similar reports. A study of 96 men who have been engaged in the manufacture of artificial abrasive grinding wheels for 25 years or more showed the following results: In good health and working —87; pensioned but in good health— nine. These men had been exposed to great amounts of dust during the years that engineering control of the dust was being developed.

—From "Health Hazards of Artificial Abrasive Grinding Wheels," by DR. W. IRVING CLARK, The Norton Company, at Seventh Annual Meeting, Industrial Hygiene Foundation.

HANDWRITING analysis is being increasingly employed by manufacturers of war equipment for the purpose of fitting employees into the jobs for which they are best suited through latent ability and temperament and also for the purpose of learning of inherent weaknesses of character and moral standards. So active has been the demand for such analytical service that one of the country's oldest and best known handwriting experts engaged solely in commercial analyses, has had to move to the West Coast in order promptly to serve some of his more important clients. The personnel director of one large war plant explained that competent handwriting analyses disclose traits of temperament which would tend to make the advancement of one employee to a foremanship highly questionable yet, on the other hand indicated that such a worker could be effectively trained for any mechanical job of responsi-



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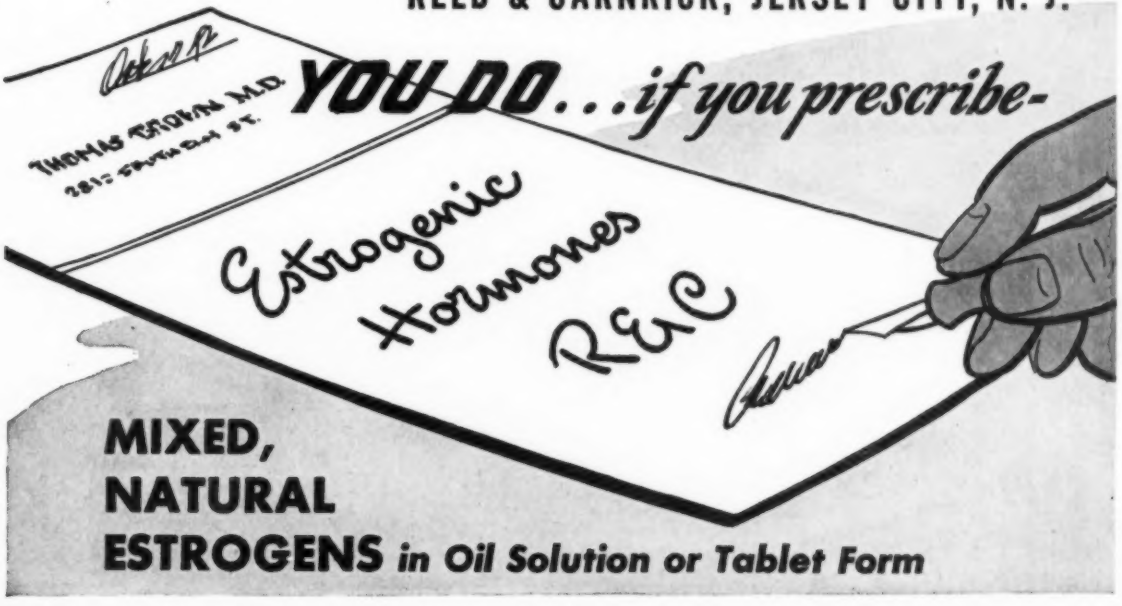

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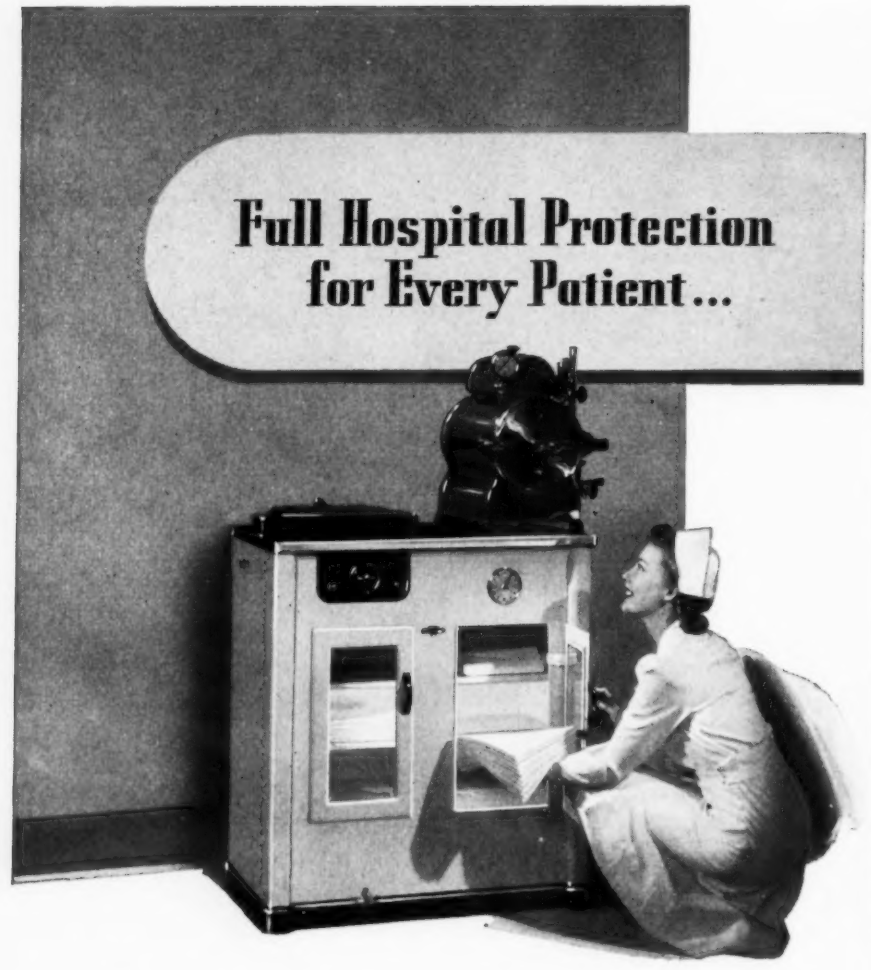

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bility other than one where either the training or supervision of others is concerned. Such knowledge, it is stated, has been found superior to that developed from all other types of psychology or IQ tests and has saved the company much valuable time and money.

—*New York Journal of Commerce*, December 8, 1942.

INDUSTRIAL HEALTH and tuberculosis in industry are topics of great concern to all nations at war. Britain was confronted much earlier than we were by problems arising from the conversion of peace economy to war production. The following are from recent British publications: Information about tuberculous disease or previous treatment at a sanatorium or dispensary should be made compulsory for all persons entering industry. This is the practice at military boards and there appears no legitimate reason why this should not be incorporated into the civilian industrial life. Such a measure would ensure the control of infection in the interests of the health of the community. Naturally, such a course will occasion opposition. It will be argued that this represents an encroachment on the freedom of the individual; however, freedom would be an intolerable institution if it permitted an individual indiscriminately to infect with disease his fellow creatures. (Bertram Mann, *Tubercle*, March, 1942.) Factors underlying the increasing incidence of tuberculosis are the background of mental tension and anxiety due to the war which affects the population as a whole; overwork, often associated with unaccustomed heavy work, with long hours, usually with additional voluntary duties, resulting in marked fatigue; the increased exposure to infection from the large numbers absorbed in industry; the overcrowding now prevailing, which must be regarded as an important factor in the spread of disease, especially when associated with "black-out" conditions and the lowered standard of nutrition associated with a restricted dietary. (Sidney Deaner, Chief Tuberculosis Officer, Worcestershire County, England. *J. Royal Inst. Pub. Health & Hyg.*, October, 1942.) Tuberculosis is coming to be regarded more and more as a disease of economics. (Editorial, *Tubercle*, March 21, 1942.)

AMONG courses for public health nurses scheduled at the Center for Continuation Study on the University of Minnesota campus during the 1942-43 term is one on Mental Hygiene given at the Center, October 29, 30 and 31, in conjunction with the health section of the Minnesota Educational Association. Other courses include one on Rheumatic Fever to be given in February, and another on Communicable Diseases and Poliomyelitis to be given in May. All are three-day sessions.

—*Minnesota Medicine*, October, 1942.

A FACTOR limiting British production in terms of manpower is the relative obsolescence of British equipment as compared with our own. Single purpose machines, used in the United States as part of assembly line technique, are less frequent in England. On the other hand, the working day of aircraft labor is about 15% higher than in the United States, and "it is possible that the intensity of labor effort is somewhat greater." Workers in aircraft plants "are more aware of the actual meaning of war than are the workers in this country."

—From a WPB press release.

JOSEPH H. KING, Chairman of the Red Cross blood donor service, reports that 23% of the 15,251 volunteers reporting to the mobile blood donor unit visiting residential areas, industrial plants and educational institutions, were rejected. More than 14% had a low hemoglobin count. In 10 industrial plants visited by the unit, rejections ranged between 30 and 50%. Twenty women were turned down for each man rejected at these plants, a fact said to be partly, but not entirely, explainable by the preponderance of women in employment there. Of the volunteers rejected, 10% were from urban residential districts, 17% from rural areas, 32% from educational institutions where some were under age, and 41% from industrial plants.

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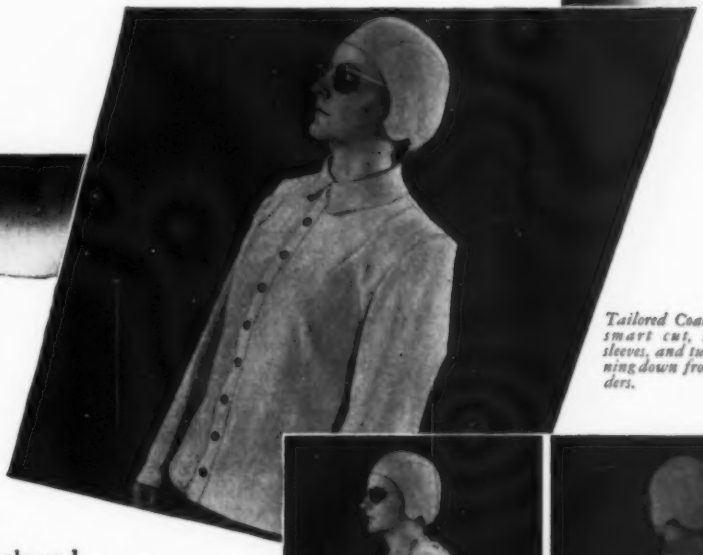

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AO Tailored Protective Clothing is made of specially selected chrome tanned cowhide. It is as light in weight as possible, consistent with adequate protection. All garments have a soft suede-like appearance. Included in the line are Tailored Coats, Short Jackets, Overalls, Sleeves, Aprons, and a Cap to protect women's hair and ears during the welding operation. For further details, get in touch with your nearest AO Branch Office.

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While the blood donor service was not diagnostic, other causes of rejection besides anemia were faulty blood pressure and pulse, common colds, and blood disease.

—News Item.

THE War Department has announced establishment of an army industrial hygiene laboratory at the school of hygiene and public health, John Hopkins University, Baltimore. The laboratory is charged with maintaining safe standards of occupational hygiene in army-owned arsenals, industrial plants, and depots. Duties of the laboratory include periodic inspection of army-owned plants to guard against such occupation hazards as poor lighting, toxics in the atmosphere and dangerous operational practices. An industrial hygiene engineer will be stationed permanently in each of the larger plants producing materiel for the ordnance department and the chemical warfare service. Surveys of both large and small plants will be conducted by field teams composed of two officers—a chemist and an engineer.

—*Chicago Journal of Commerce.*

ALTHOUGH the nation's tuberculosis rate so far has shown no tendency to increase, the U. S. Public Health Service has gone into action with preventive measures. Into the nation's factories they are sending eight mobile medical units to take x-ray pictures of the workers' lungs on small film. Each one of these units complete with medical officer, technician and nurse, can photograph from 300 to 500 subjects a day. This is in distinct contrast to the normal slow x-ray process, in which larger film plates are used. So far about 50,000 workers have been examined. About one in 100 have been found to have tuberculosis in some degree and have been culled out. These measures are striking at the heart of this widespread dangerous disease. One mobile health unit has been sent to Mexico City to examine workers being brought into California. Importation of infection is prevented.

—*New York Wall St. Journal.*

COMMENT and OPINION

TWO years after Pearl Harbor Uncle Sam will need a record labor force—63,200,000 pairs of hands—to wage the war, make the munitions of war, to raise the food to keep the home hearth blazing, the War Manpower Commission estimates. By the end of 1943 or early in 1944 the Commission expects that 9,700,000 citizens will be in the armed forces, 20,000,000 in war industry, 19,600,000 in civilian industry, 7,900,000 in year-round farm work, and the remainder in miscellaneous occupations. Additional millions will be needed seasonably in the various agricultural areas.

—OWI release.

IT HAS been commonly quoted from records of hospital admissions that less than two cases of malnutrition appear for each 1000 admissions. These figures are undoubtedly low for the same reasons that apply to the criticism of data based on official mortality rates, namely, incompleteness due to non-recognition, mislabeling, and precedence given to certain diseases over others. The hospitalized population is not a representative group. Finally, certain anatomic lesions of malnutrition such as dental caries may be so prevalent that they are disregarded for purposes of recording.

—From "How Prevalent is Malnutrition," in *Nutrition Reviews*, December, 1942.

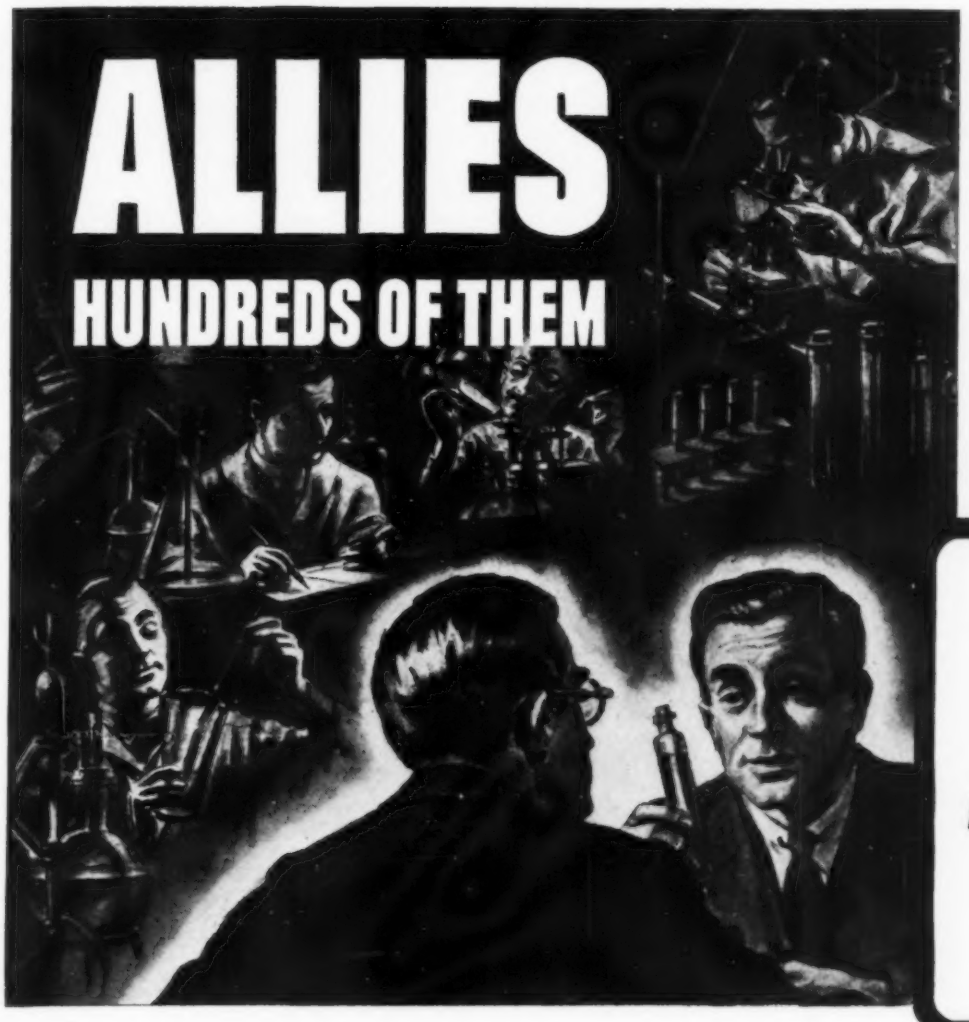
THE *Deutsche Med. Wchnschr.*, July 10, contains a review of an article by Prof. Staub on the influence of drugs on mental and physical performance. He asserts that, in contrast to the first world war, the consumption of alcohol has been found not to promote the capacity for military operations but to be definitely detrimental. Amphetamine and pervitin (a synthetic amine chemically related to ephedrine) are indicated when a single special performance is wanted. There must, however, be a corresponding training and adequate nutrition. In the view of the writer these two drugs are a necessity for motorized troops, as they increase the performance and faculty of observation, while the monotony of driving and the loud noise tire the men and make them sleepy. It would be difficult to imagine a long distance night flight without these two drugs.

—From "Public Health under Hitler," *J.A.M.A.*, December 19, 1942.

WRITING in *Executives*, published by Metropolitan Life, DR. CHAS. F. LONG, chairman of the Committee on Industrial Health, Medical Society of Pennsylvania, says: "With every available man working or fighting, husbands cannot be relied on for child care, so it is inevitable that day nurseries will before long blossom into being. It is no wild stretch of the imagination to prophesy that very soon industrial management must learn to run these day nurseries if they hope to keep mothers at machines."

—*Textile Bulletin*, Charlotte, N. C.

SILICOSIS should be of particular interest to engineers because the control is chiefly an engineering problem. The chemist also has an interest since the problem of detecting the hazard is partly a chemical one. Medical science has accomplished much in the diagnosis and description of the various stages of silicosis. The medical profession can give logical explanations of the action of silica in the lungs, but at the present the physician can do little for the silicotic with tuberculosis except to estimate the number of months he



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may live. Inasmuch as silicosis is a progressive incurable condition, the engineer is the one person who can accomplish much in its control, since dust production is generally the result of poor engineering practice.

—WILLIAM M. PIERCE, in *Chem. & Metl. Eng.*

THERE are great advantages, measured in terms of production and of lowered costs, in supervising the living conditions of workers at home, as the experiment carried on over a period of years by the St. Joseph Lead Company has shown. The St. Joseph Company undertook to provide the kind of homes and advantages which would permit all of their workers to raise families satisfactorily and to send their children to good schools. The return in reduced turnover alone showed a clear profit. But that kind of worker-protection is largely out of the question during wartime. At the same time, plant precautions against overwork and ill health are more essential than ever and should be part of the responsibility of every physician who in any way serves the industrial effort.

—Industrial Health Page, *Minnesota Medicine*, November, 1942.

WE ARE pleased to note that the United States Supreme Court has expressed a willingness to review the decisions of a United States Court of Appeals, which had affirmed a decision of a Federal District Court that the American Medical Association was a trust and that medicine was a trade rather than a profession. Be it remembered that the Supreme Court has the power to refuse to make such reconsiderations, and the fact that it will do so in this case is a matter of utmost importance to the medical profession. We welcome a showdown in the matter; we would like to know just what our status is, that our future plans may be made in accordance with the decision of that final legal body.

—*J. Indiana State M. A.*, December, 1942.

SEBRELL discusses manifestations of vitamin B-complex deficiencies, with special reference to their incidence in the United States. He states that judging by the number of patients who appear in the clinic with mild symptoms of deficiency of one or more members of the B-complex, deficiency of this vitamin is apparently an important medical problem, and that by increasing the content of B-complex factors in the diets of a large part of the population, the health of the nation as a whole may be much improved.

—*Ann. Int. Med.*; abstr. in *Roche Review*, December, 1942.

BETWEEN-MEALS intermissions in war plants to give workers time for "pickup snacks" of peanuts and raisins were recommended today by the State Labor Department to keep production rates at high levels. Workers in New York plants are not getting enough of the proper foods, the department's *Industrial Hygiene* Division reported after a survey of nearly 2,000 plants. "Between-meals snacks for a pickup have been found to be invaluable in eliminating mid-morning and mid-afternoon fatigue," said Dr. May R. Mayers, of the division. Personnel managers claim labor relations "definitely deteriorate" when plants are unable to provide workers with proper food, Dr. Mayers asserted. She suggested providing foods rich in vitamins and minerals usually lacking in the lunch box prepared at home. Milk topped her list for these supplemental lunches. Other items were fruit and vegetable juices, hot soups and coffee, raw mixed vegetables, cheese, and sandwiches.

—*New York Wall St. Journal.*

AT THE recent French Lick session the Indiana State Medical Association passed a resolution to the effect that the coming session of the Indiana legislature be asked to enact a measure providing for the immunization of all school children against smallpox and diphtheria prior to their entering school; immunization against typhoid fever of all school children during the war, and typhoid fever and smallpox immunization of all employees in the primary defense industries. This is more than a health measure, although this phase of the matter should be sufficient for the consideration of members of the legislature. A vitally important phase is the conservation of medical resources. If all the children of Indiana were thus immunized and if all the employees in our defense industries were free from the possibility of these preventable diseases, much time would be saved by the already overworked physicians remaining at home. There is not the slightest excuse for either of these diseases gaining any sort of foothold within our

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state since immunization affords protection in practically every case.

—*J. Indiana State M. A.*, December, 1942.

MEDICAL check-ups are always worth their cost to the plant management; they ward off possible dangerous ailments that may cut into the working force. Just as the Army requires frequent check-ups of its soldiers' health, so we should require frequent check-ups of the plant employee's health. Even a minor check-up will help the worker keep himself in condition to "stay on the job all of the time." The same thing applies to preventive medicine, i.e., vaccinations against probable diseases. Every bottling plant executive can well give serious consideration to the inauguration of such a plan in his own plant, no matter how many employees he may have working therein.

—*National Bottlers Gazette.*

MANY persons do not realize that fatigue is often unnecessary. Precautions may be taken which will help prevent fatigue. Studies of industrial efficiency prove that the nature and severeness of fatigue may be modified by rest periods, food, working techniques and habits. At the General Electric plants, all departments are given a few minutes for relaxation in the morning and in the afternoon. "One way to decrease accidents is to decrease fatigue," said Safety Engineer Rudolph Jacobs of the Edison General Electric Appliance Company, Inc. "Rest periods, with some refreshment, increase efficiency and production throughout the day." Mr. Jacobs' conclusions closely correspond to the results of an experiment which was conducted at the Western Electric Company. The tests were made over a period of approximately seven months to find the effects of various types of recess periods. First, workers were given two rest periods of five minutes each —one at 10:00 in the morning and another at 2:00 in the afternoon. This system resulted in increased output. Ten-minute rest periods were then introduced and a rise in production was evident immediately. Still another recess system was tested. Six five-minute periods were set aside each day for rest. This plan, however, was unsatisfactory. Finally, two 15-minute periods, one at 9:30 in the morning, the other at 2:30 in the afternoon, were given to the workers. During the morning recess, light refreshments were served. Again, an increase in production resulted. It was decided that this was the most effective plan. From these tests, it was concluded that the general improvement in the rate of production was due to the introduction of rest periods, and that rest periods prevent cumulative fatigue.

—From "Fatigue versus Efficiency," prepared for American Bottlers of Carbonated Beverages.

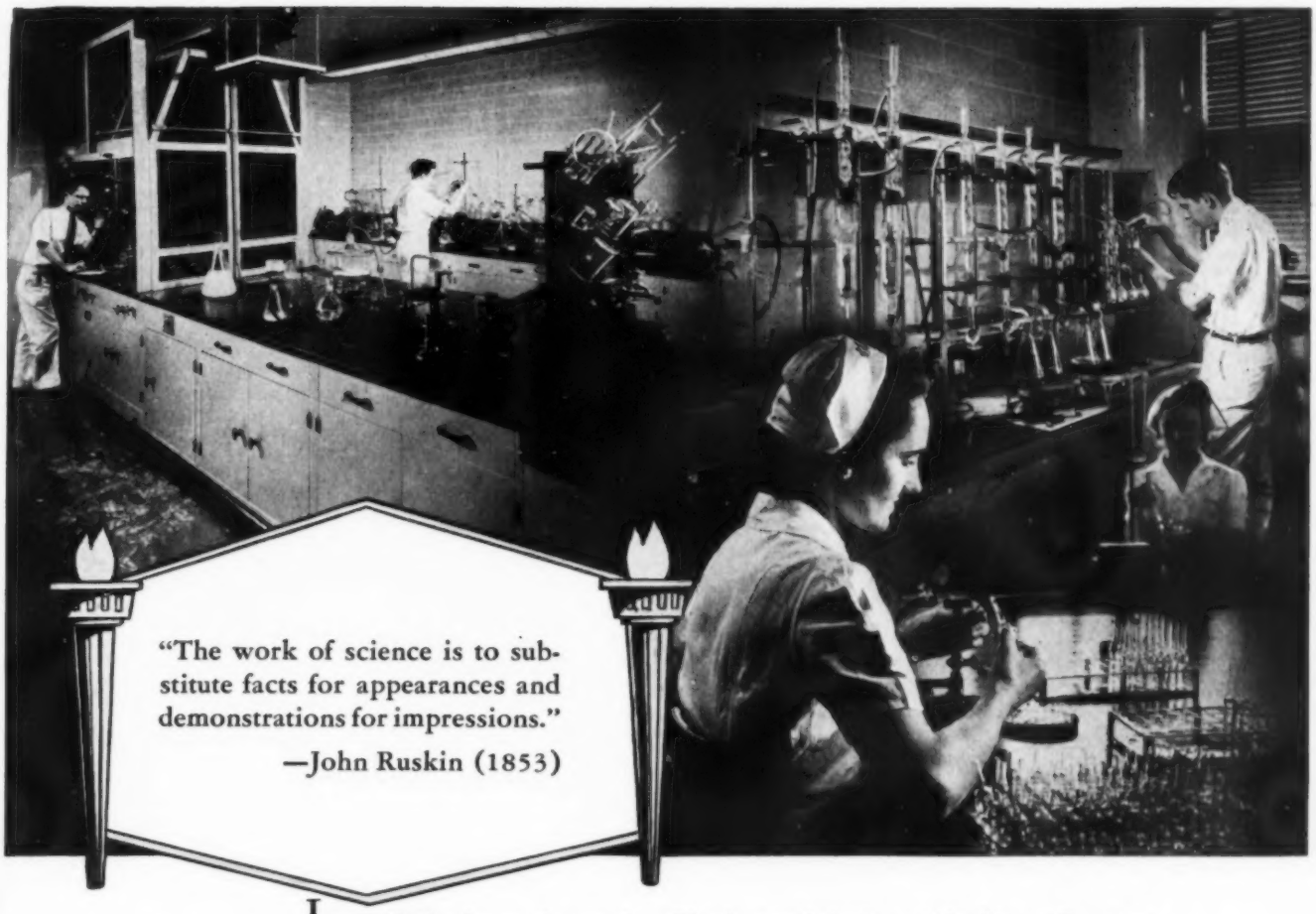
ONLY casual attention has been directed toward the problem of employing the diabetic in industry, professions and civil service. An estimated 660,000 persons in the United States, or one-half of 1% of the total population, have diabetes. In most cases the diabetic is unable to earn his livelihood unless he enters certain professions or becomes an independent business man, and he cannot obtain life insurance.

—H. O. MOSENTHAL, M.D., in "The Diabetic and Employment," *New York State J. Med.*, August 15; abstr. in *Modern Med.*, December, 1942.

TO KEEP the men in the Army in fighting trim will require 10 times the number of doctors per unit of military population that will remain for the civilian population, and yet civilian war workers and their dependents should have good medical care if production is to be maintained at peak efficiency. This is total war. It is just as important to provide health services for the men and women who produce the food, munitions, airplanes and the mechanical equipment for the armed forces as it is to provide adequate health services for the forces themselves. In fact, I think it fair to say that one of the surest ways to reduce casualties is to make sure that the armed forces have more and better equipment than the enemy. If this is done, the health of civilian war workers must be maintained so that they can produce the equipment.

—SURGEON-GENERAL THOMAS PARRAN, U.S.P.H.S., in "The Health of Our Nation in Wartime," Annual Conference of Secretaries and Editors of Constituent State Medical Associations, *J.A.M.A.*, December 12.

IN EXPERIMENTS on the efficiency of industrial workers it was found that when the blood sugar was low, the muscular efficiency—and consequently the output—of the workers decreased. When the blood sugar and muscular efficiency of the workers



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had fallen to fasting levels, as they were found to do within three hours after the last meal, the ingestion of 30 grams of glucose or 225 cc. of fruit juice raised the blood sugar 75% and the muscular efficiency 25%. From this evidence it appears justifiable to conclude that the total amount of work and the efficiency with which one can do it are decreased when the blood sugar falls below some optimal value. There is, however, no evidence that in normal humans fatigue can be delayed or decreased by maintaining a super-optimal blood sugar level. One might, also, criticize the results of the experiments on the industrial workers on the basis that it has been shown that almost anything one does to change the worker's routine will increase output.

—AUSTIN F. HENSCHEL, in "Diet and Muscular Fatigue," *Minnesota Med.*, December, 1942.

Minor Injuries

TREATMENT of minor injuries is another important part of the nurse's work. Today there is no place where minor injuries are given better care than in the medical departments of industry. Infections are reduced to a minimum because of readily available facilities for treating minor cuts. With the right kind of safety program aided and abetted by the nurse, employees can readily be taught not to neglect the so-called trivial injuries that they are certain to receive and to come to the medical department at least on the same day as the injury occurs. In the Dennison Manufacturing Company there have been no lost time accidents caused by infected wounds for more than 12 years, among the injured who have reported to the factory medical department on the day of receiving the injury.

—HALSTEAD G. MURRAY, M.D., in "How Can the Industrial Nurse Help," *Occupational Hazards.*

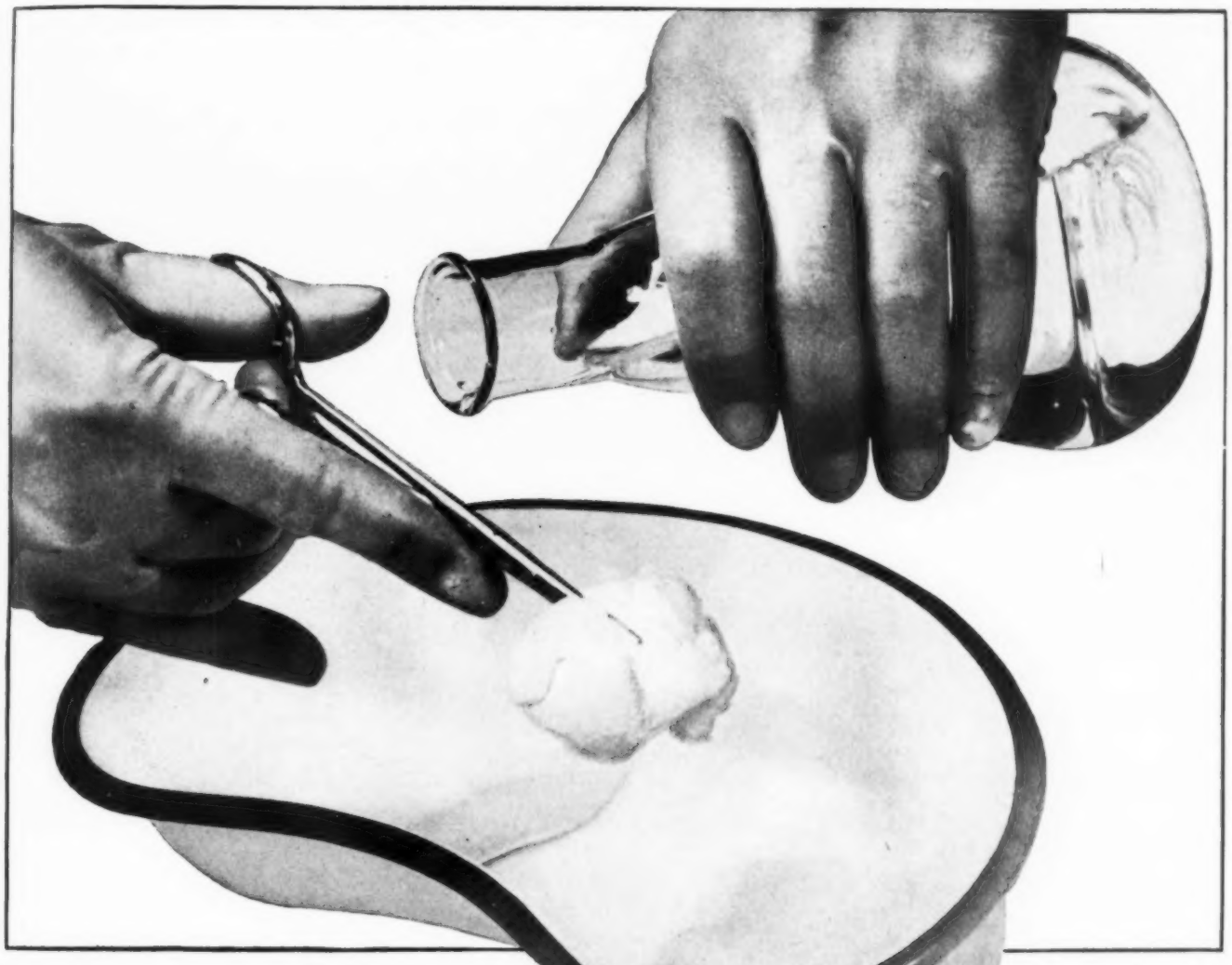
Diet

A GOOD, sensible diet, plenty of rest and treatment by medicine in a few cases could remedy 90% of the poor health now interfering with war production. In most instances proper food and rest are available, but both male and female workers are harming themselves by failing to eat substantial tissue building foods and failing to get the eight or nine hours' sleep needed for manual labor. The average person usually knows what foods he should eat. A proper diet will include rich blood-building foods such as soups from meat stocks, a serving of meat a day, large quantities of fresh vegetables and rough foods, fresh eggs daily and a pint to a quart of milk a day, plus whole wheat bread and the usual quantities of potatoes and sweets, not interfering with the more important part of the diet. In most cases of malnutrition a good, sensible attitude toward food will allow the body to adjust itself. Special tablets and capsules can be used, but under prescription.

—News Item, quoting DR. IRVING S. CUTTER, Health Editor of the *Chicago Tribune.*

Their Shadows Before

DURING the war occupational associations in Brazil cannot hold general meetings without first obtaining the written permission of the Minister of Labour and Social Welfare. . . . It is estimated in Germany that soon one out of every four workers employed there will be a foreigner and that the proportion will be even higher in agriculture. . . . The British Director-General of Man-Power states that one million women part-time workers will be needed in 1943, as compared with the 250,000 employed in September 1942. . . . For the fixing of women's wages the Industrial Emergency Council in New Zealand has adopted the principle of equal pay for equal work. . . . Conscription for service in the Nigerian tin mines has been introduced in order to increase output to the utmost as part of the war effort. . . . In Croatia young persons who wish to become apprenticed or enter a technical school are bound to consult one of the new vocational guidance offices.



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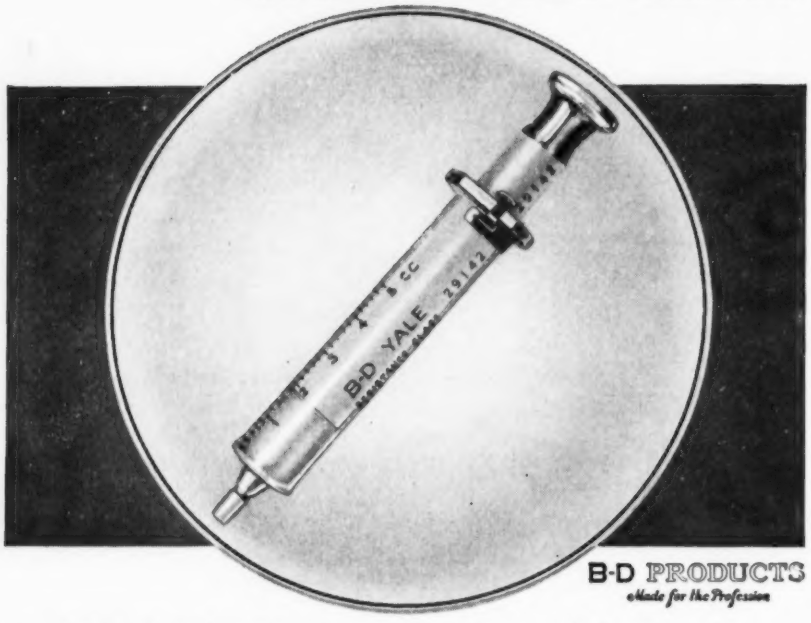

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. . . The U.S.S.R. universities have been geared to meet defence needs, and the number of specialists who completed their training in 1941-42 was nearly double the figure for the previous year.

—*Monthly Labor Review*, December, 1942.

Meals

A NUTRITIONIST and industrial hygiene nurse of the Illinois State Health Department recently observed 1,102 luncheon trays in cafeterias of four Chicagoland war plants. They found that only 8% of the workers chose adequate foods, 21% chose food bordering on the nutrition danger line, and 71% purchased totally inadequate meals. MISS GERTRUDE SMITH, nutritionist for a large industrial research foundation, observed food selected by 1,020 workers in a 24-hour period. Twenty-eight per cent had no milk with any meals, 22% no fruits, 44% no eggs, 70% no cereal, and 22% no green vegetables. DR. ROBERT S. GOODHART visited 33 industrial concerns and discovered that most war workers chose poorly balanced meals even when a choice food was available. Only 10 to 20% of them drank enough milk.

—News Item.

Vitamin B?

ONE of the most interesting fruits of research concerned with the vitamins is the accumulating knowledge that personality changes may be intimately concerned with vitamin B deficiency states. According to R. D. Williams and others in studies on induced thiamin and vitamin B deficiency in humans, the earliest symptoms were personality changes. Irritability, moodiness, pugnacity, depression, apprehension, and poor cooperation and coordination, with diminishing mental faculties, have been carefully noted by several investigators. Can it be that throughout our long and turbulent history, the sour-pusses, the malcontents, the agitators and troublemongers, the Prussian personalities, the snapping parents who are feared by their children, the blue-noses struggling to "reform" erring humanity, the hypochondriac, could all have been cured by an adequate vitamin B intake? Or is the cussedness of some people just inherent in their genes?

—Editorial Note, *Rocky Mountain M. J.* December, 1942.

Manganese

HEALTH hazard to workers comes largely in the plants where the ore is crushed. After crushing, the fine powder is bagged in paper sacks; and both crushing and bagging are very dusty operations. Manganese poisoning is a chronic disease—its symptoms, muscular stiffness and an inability to make muscles work together. Those afflicted fall when they walk backwards. They may have difficulty in talking. Twitching of the muscles of the face is another indication of the disease. There also is complaint of drowsiness, weakness, and muscular cramps. Once the disease is well established there seems to be very little hope of cure. The importance to industry, not only from the humanitarian but also the economic viewpoint, of adequately protecting workers from this health hazard may be judged from a case in New Jersey in which the plaintiff was given a high award for illness due to inhaling manganese dust.

—*Occupational Hazards*, November, 1942.

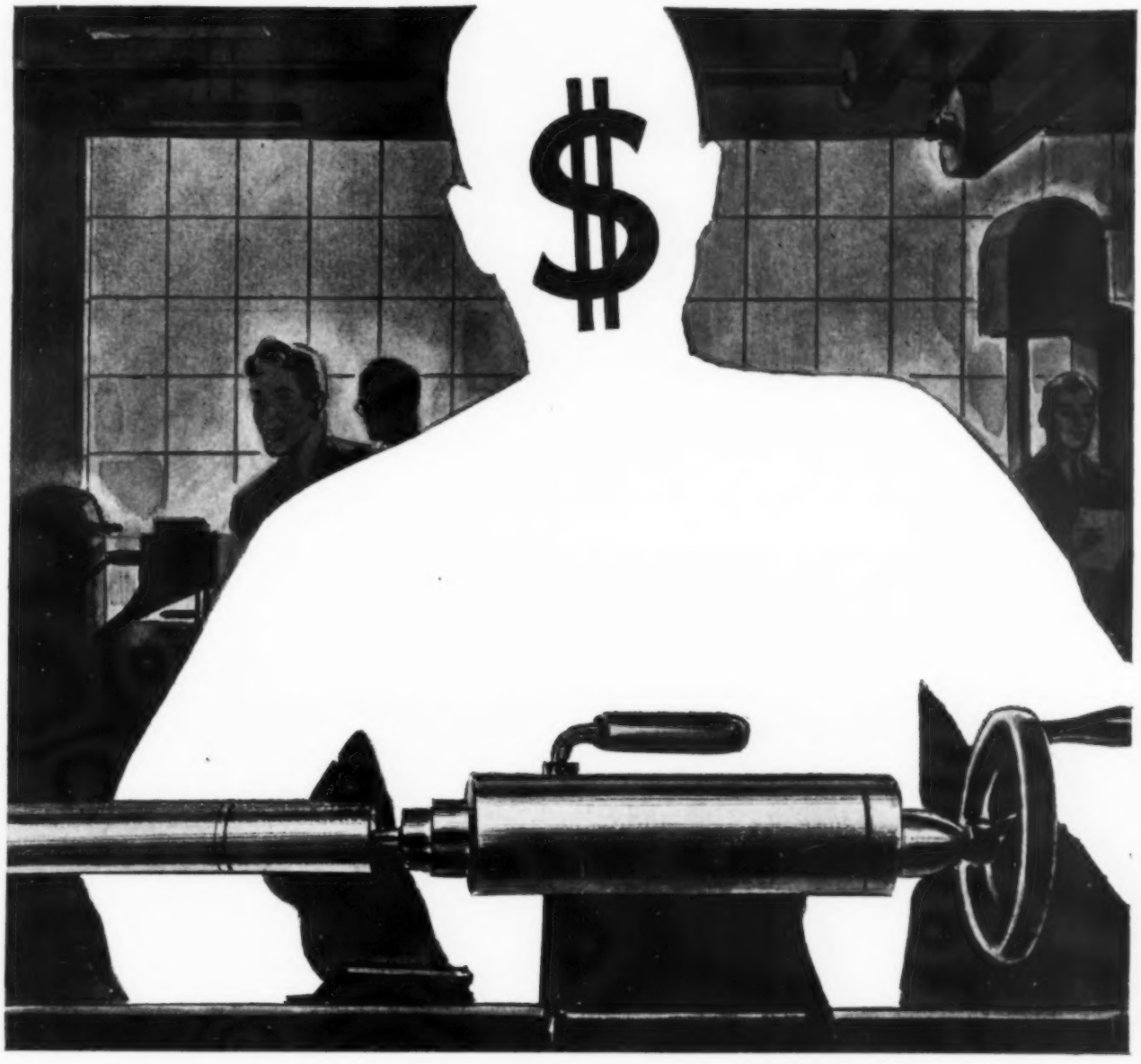
Feet

IT IS time for our profession to bring to the attention of all concerned with safety education-management, unions, insurance companies, etc., the value of foot care in accident prevention programs. If our workers in war industry are to maintain a high degree of productive efficiency, they must be made to realize the importance of preventing foot disabilities and how, where and when to secure adequate treatment when such disabilities occur. The National Association of Chiropodists is keenly aware of the great need for a comprehensive program devoted to foot care in industry and is making plans to conduct a survey of the entire problem.

—From an Editorial in *J. Natl. Assoc. Chiropodists*, November, 1942.

Fatigue

EMPHASIZING that "the fatigued worker" not only is a primary liability but may affect adversely the good nature, health, well-being, and performance of other "workers," LT.-COL. D. B. DILL of the U. S. Army Air Corps, called upon the doctors of Connecticut to strive toward an ideal solution of the fatigue problem, as he delivered the eighth lecture in a series on Industrial Health and Medicine at the Yale School of



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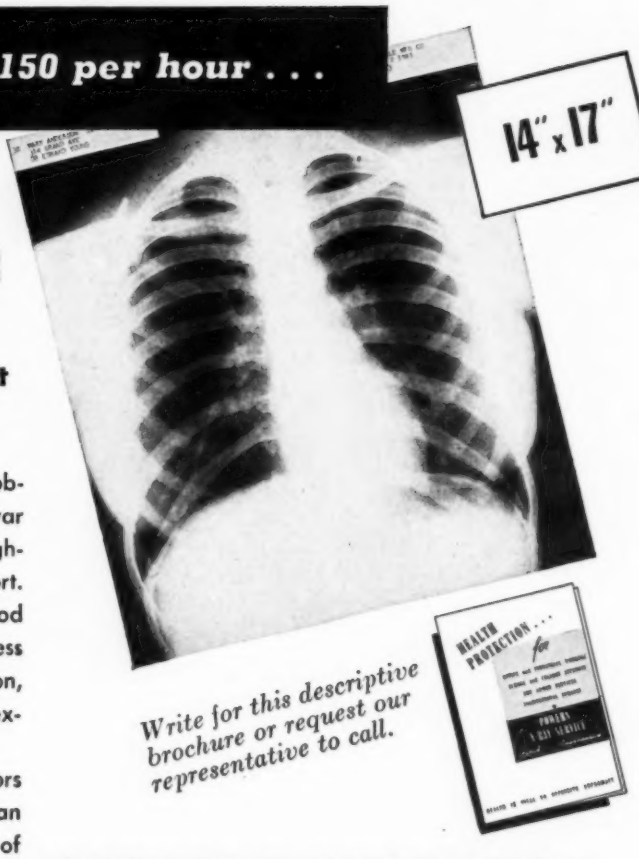

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Medicine. "Critics have often remarked that the day of fatigue in industry has passed," said COL. DILL, "and it was argued that the machine age had lightened the burden on the worker and shortened his hours. But even in pre-war years we were able to find many instances where fatigue of the old-fashioned kind was still experienced." As examples in which the fatigue problem has cut down the efficiency of the worker, COL. DILL cited the construction of Boulder Dam, work in the steel mills of Youngstown, Ohio, and in the cotton growing district of the Mississippi Delta. "War itself has taught us much about the origin of fatigue and the steps that can be taken to minimize it," he said. As an approach to the ultimate elimination of fatigue in war industry, he drew attention to the fact that fatigue is a result of mutually dependent, manifold factors, and that only when such conditions as intensity of work, rest periods, temperature, and humidity are taken into consideration and corrected, will it be eliminated in industry. "When the employer takes thought for the welfare of his employees, he will find that they are less fatigued by a given amount of work, that they take less sick leave, and stay with their jobs more contentedly and thus contribute most effectively towards winning the war." In a seminar following, B. B. POSTMAN of the Connecticut State Department of Health, discussed the importance of adequate control to protect the health of our industrial population from the effects of toxic materials. The problem is becoming complicated, he asserted, since not only are new and little known toxic materials being introduced in industrial processes, but some of the older and well known toxic agents are being used in increasing quantities. The use of solvents, such as benzol in the rubber industry, flouride flux in brazing, radium dial painting for aircraft instruments, and metal cleaning with strong alkalies or chlorinated solvents were mentioned as presenting serious health hazards which must be controlled.

—New Haven (Conn.) Register.

Dermatoses

INDUSTRIAL or occupational dermatoses comprise those skin conditions which are due wholly or in part to various noxious agents encountered during employment. It is very important to establish definitely whether or not the dermatosis is the result of employment since the employer, the employee, the insurance carriers, and the State Industrial Commission are all vitally concerned. Certain diagnostic criteria may be listed in establishing the diagnosis: (1) The dermatosis appears during employment. (2) The dermatosis tends to clear up when the patient is away from work. (3) The dermatosis tends to reappear when the same work is resumed. (4) Other persons doing similar work are similarly affected. (5) The dermatosis may be reproduced or simulated by patch test. (6) Other possible causes have been eliminated. The patch test in which the suspected material in the proper concentration is applied to the skin gives strong supportive evidence, yet there are certain limitations which should be pointed out. The patch test may be negative because of local tissue immunity, the solution tested may be in too weak a dilution or the actual working conditions may not be accurately reproduced. On the other hand false positives are encountered when the patient has a polysensitivity or when the material used for testing is a primary irritant. Industrial dermatoses may be prevented by the following approach: (1) Careful examination of employees for pre-existing skin diseases. (2) The use of clinical history and patch test as an aid in evaluating susceptibility to possible future irritants. (3) Protective devices such as special clothing, creams, mechanical devices, etc. (4) Proper hygiene in plant and workers. (5) Change in manufacturing processes in which less irritating materials are substituted for the more noxious ones. Treatment should be begun early since if allowed to progress for a long time

To Facilitate Diagnosis

and instrumentation involving engorged mucus membranes,

utilize the fast, powerful, sustained vasoconstriction of

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In a clinical test of 200 industrial cases, Domeboro tabs made a solution that "acted more rapidly and with greater effectiveness than Burow's, Boric Acid, or Aqueous Magnesium Sulphate, fostering more rapid healing, reducing the time of convalescence, and aborting tendencies toward infection," reports Dr. Judson C. Fisher.[1]

In the majority of these industrial cases, Domeboro Tabs, the new wet-dressing solution, was the *only* medication used.

This recent work on Domeboro Tabs confirms previous investigations which stress the advantage of using a *lead-free* stable solution. The tablets are convenient, easy to use so that patients can continue treatment at home. This markedly lessens the time of convalescence.

When cases of inflammation, dermatoses, bruise, swelling, wound, or eczema call for a wet-dressing, remember. Domeboro Tabs bring better results—faster!

[1]*Fisher, Judson C., The Journal-Lancet, (March)* 1942

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chronic dermatoses develop in which many secondary factors play a part. Complete removal of the causative agent or agents is imperative for cure and this may be done by substituting non-irritating materials or changing the person's job in the same plant. Local therapy should consist essentially of soothing applications such as warm saline compresses, simple cold cream, and some antipruritic lotion. The older and more chronic eruptions also require the use of various stimulants, ultraviolet light or x-ray therapy and usually need the services of a dermatologist trained in the diagnosis of these problems.

—J. LAMAR CALLOWAY, M.D., in "The Diagnosis and Management of Industrial Dermatoses," *Southern Med. & Surg.*, November, 1942.

Small Wounds

FIRST AID always begins by preventing accidents. One of the best ways to prevent accidents is by having a careful physical examination of all employees before they start to work. This examination should be repeated if the employee has had a serious injury or accident. In organizing any first-aid procedure for injured workmen, men should be picked who not only have had first-aid instruction but who have practical ability for taking care of an injured man. In a large plant where an official first-aid station is maintained, probably manned by a graduate nurse or a doctor, this is not necessary. Instructions for first-aiders should be extremely simple, clear-cut, and of such a nature that they can be understood by any workman. These instructions can be improved by having illustrations or pictures showing the use of certain equipment, such as bandages, splints and so forth. It may be that the specific instructions of a surgeon for a specialized type of industry are necessary but in general all instructions should be simple. First-aid kits are essential. In the electric industry, we have kits to fit each truck where there are small crews. In these kits are bandages and other equipment, most of which have illustrations in the form of pictures showing how the equipment is to be used. I believe a first-aid kit should contain sterile gauze compresses of varying sizes, bandages, splints, and possibly a tourniquet. I think this makes an excellent first-aid kit. Employers and employees alike should realize that the day when the injured workman dashes to the medical kit and pours some iodine or other antiseptic into a wound and then forgets it, has passed. We should also appreciate that we are not making doctors out of first-aiders. All wounds regardless of size and the embarrassment of the employee sustaining the wound should be reported and taken care of. It is a well-known fact that serious complications more frequently follow small wounds than large wounds. In many industries, men are penalized in some way for not reporting any and every wound. In treating these wounds we should impress on the workman who has received one that nothing should be done which will increase injury in the first-aid care.

—R. F. MCGANDY, M.D., in "First Aid to the Injured Workman," *Minnesota Med.*, December.

Benzene Poisoning

THE national defense program, altering industry to suit its needs, has placed increasing burdens on the industrial physician, especially in the rubber industry with its increased use of benzene and its physical hazards. Poisoning from it is due to absorption by the respiratory, alimentary or cutaneous route. The statistics of a factory using benzene in small quantities for years show that, with the advent of large war orders and the increasing use of synthetic rubber, workers came to the company hospital with complaints of malaise, nausea and vomiting, and a few with bleeding. Immediate blood counts were done on the 1,104 people using benzene; in 83, or 7.5%, there were mild blood changes and symptoms of slight absorption of benzene fumes. Twenty-five, or 2.2%, showed severe blood changes with symptoms of severe benzene intoxication; nine of these 25 were hospitalized and received from two to 50 blood transfusions. Three of the nine died. This low mortality incidence was believed to be due to the extreme amount of treatment received, consisting of multiple whole blood and direct bone

The "Blow" that helps Hitler!

59,000,000 working days are lost in a normal year because of colds. This year, America just can't afford such a loss. The nation's workers *must* be strong—must keep up their resistance. *They are not strong enough now.*

National Research Council surveys[1] show that 71% of our industrial workers are living on inadequate diets... diets dangerously lacking in essential vitamins and minerals. Leading scientists and nutritional authorities agree that this "hidden hunger" of vitamin-mineral deficiency is an important contributory cause of colds and general absentee illness.

WHAT CAN INDUSTRY DO?

We should, of course, educate workers and their wives to choose the right foods and prepare them properly. But it may be years before education can take effect. Meanwhile, you have another way—*a faster, more direct way*—to make sure your workers get all the vitamins and minerals they may need.

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Vitamins and minerals in concentrate form are effective in helping to build resistance and combating the half-health that can result from inadequate diets. Plants and offices that have given extra vitamins and minerals to their workers report less time lost, fewer colds, less fatigue, improved efficiency and morale.

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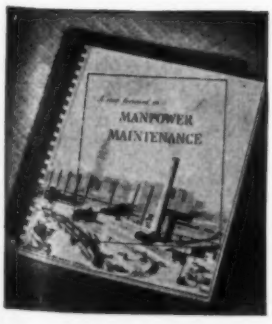
[1] The Food and Nutrition of Industrial Workers in Wartime
[2] Food and Drug Administration
[3] Jour. of the A.M.A., July 18, 1942, pp. 948-9



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marrow transfusions, and liver, iron, calcium, phosphorus, yellow bone marrow and multiple vitamin therapy. Prophylactic measures include adequate ventilation and constant medical supervision; that is, frequent blood examinations. Frequent air samples should be tested with a combustible gas indicator and ventilation introduced to keep the concentration of benzene in the air below one hundred parts per million. No one should be permitted to work in a benzene department with a leukocyte count below 5,000 or one above 13,000. After 10 days of employment the employee should be given a urinary sulfate test; if the ratio is below 50 a tendency to absorption exists and the employee should be removed from the benzene department. Also a drop of 5% in any blood component is sufficient reason for removal. An ideal arrangement would be repeated blood checks on exposed employees.

—R. H. WILSON, in *J. Lab. & Clin. Med.*; abstr. in *J.A.M.A.*, December 12.

Fracture Treatment

THE basic treatment of compound wounds is débridement and immobilization. Sulfonamide implanted locally is effective only with careful débridement within six or eight hours after injury, complete immobilization, and appropriate measures to maintain good circulation and body temperature in the wound. In the Minneapolis General Hospital this treatment reduced the incidence of infection in compound fractures from about 27 per cent to 3.3 per cent. The authors believe that sulfathiazole should be given systemically and they consider a mixture of one part sulfathiazole with two parts sulfanilamide to be the best for local use. In the series studied, the average hospital stay was reduced from 96.3 days to 30 days. Two cases of gas gangrene occurred, less than 1 per cent, in 212 compound fractures which were treated with local sulfanilamide, while 7.3 per cent of the patients in the control series treated without sulfanilamide developed gas gangrene.

—Abbott's *What's New*, December, 1942.

Ohio's Nice Gesture

EVERYONE knows that when a doctor leaves his home and his hard-won practice to enter the service of his country he may as well kiss that practice adios. It just cannot be any other way, for the doctor's services to his families are personal, and depend upon continuity for a great part of their value. So, when that continuity is interrupted the chances are good that the lost thread can never be picked up again. Nevertheless, the problem of post-war adjustments between the returning doctors and their one-time patients has been the subject of much study by all concerned. As a partial solution, we rather like the procedure of the Ohio State Medical Society which posts cards in the offices of the doctors at home. The card says: "OUR OBLIGATION—Perhaps the physician who has been providing you with medical services is one of the many Ohio physicians now on duty with the Army and Navy. While he is making this sacrifice for you and me, you may count on those of us who remain on the home front to do our utmost to meet your medical needs. However, it is my sincere hope that when your doctor returns, you will resume your former relationship with him. (Signed) M.D."

—Note in *Southwestern Med.*, November, 1942.

War Surgery Meeting

THE combined annual meeting of the American Academy of Orthopedic Surgeons and the Clinical Orthopedic Society, January 17-20, 1943, at the Palmer House in Chicago, will keynote "War Surgery" and its application to civil practice. There will be (1) a clinical program; (2) a general scientific assembly; (3) an instructional section (group discussion courses, and motion pictures of surgical methods and technique); and (4) scientific exhibits. The speakers and faculty are drawn from the leading surgical authorities of this country, as well as distinguished guests from England, Canada, South America and

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*REFERENCES:

1. TERRELL, T. C. Comparative study of Foille with tannic acid preparations in the treatment of burns. Texas State J. Med. 34:409, 1938.
2. NOLAND, L. and WILSON, C. H. More recent ideas in the treatment of burns. J. M. A. Alabama, 10:157, 1940.
3. GALT, S. The use of Foille in the treatment of burns. Dallas M. J. 25:81, 1939.
4. HAMILTON, J. E. Modern burn treatment with special reference to a new dressing, "Foille." Indus. Med. 10:427, 1941.
5. HAMILTON, J. E. A comparative study of local burn treatments. Amer. J. Surgery, 58:350, 1942.

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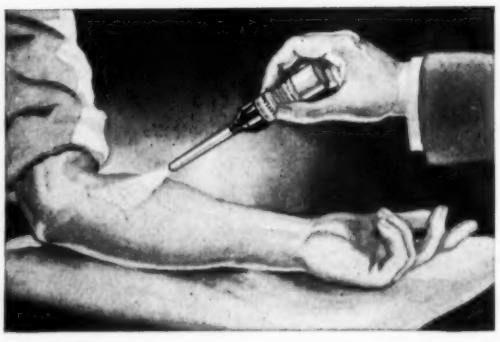

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the Hawaiian Islands. These will include a sizable group of Army and Navy Surgeons who have had to deal directly with the war casualties from across both oceans. Thorough, concise, short discussion courses will be offered on surgery of the hand; fractures; peripheral nerve injuries; amputations; lame backs; surgery of the hip; surgery of the knee; burns and war plastic procedures; foot disabilities; differential diagnosis of bone pathology; reconstructive surgery following trauma of the upper extremity; and surgical anatomy. There will be several special features: (A) An afternoon devoted to "Complicating Trauma Associated with Orthopedic Casualties," including a discussion of shock—its early recognition and treatment; blast, crush and compression injuries; thoracic injuries; head and spine injuries; gunshot injuries to abdomen; and injuries to genito-urinary tract; (B) an evening devoted to chemotherapy in the treatment of wounds; and (C) another evening given to a debate on the Kenny treatment for anterior poliomyelitis.

Avitaminosis

AS PREVIOUSLY reported, severe restriction of thiamine was found to be associated with states of inactivity, apathy, serious derangement of metabolic processes, loss of weight and finally, prostration. The present investigators studied the effect of moderate prolonged restriction of thiamine but not of food calories. States of emotional instability arose, reflected by irritability and moodiness, quarrelsomeness, lack of cooperation, vague fears progressing to agitation, mental depression, variable restriction of activity and numerous somatic symptoms. Disturbance of function of various tissues of the body occurred irregularly and were of variable degrees of severity. In all cases the mental and physical inefficiency preceded by weeks or months other more objective manifestations. The authors of the report believe that when the requirement of thiamine for the individual is judged, environmental factors, activity, diet and intestinal absorption must receive consideration.

—Abbott's *What's New*, December, 1942.

Plasma for Civilian Defense

THE Medical Division of the Office of Civilian Defense and the U. S. Public Health Service report the current status of the blood plasma program initiated in the early spring. The report indicates that 130 hospitals have now received grants-in-aid and are preparing reserves of plasma to total at least 63,130 units. In addition, 27,500 units of frozen plasma have been obtained through the Army and Navy from blood collected by the American Red Cross. This supply has been distributed. The Medical Division has also procured 37,500 units of dried plasma from blood collected by the American Red Cross, and this is in process of distribution. The total reserve, largely concentrated in the 300-mile coastal target areas, will be 126,630 units for treatment of casualties resulting from enemy action; and 1250 units are in Puerto Rico and 250 in Alaska. In addition, the Red Cross is distributing to target areas 5,000 units which will be available to the Office of Civilian Defense for treatment of civilian casualties resulting from enemy action. Many hospitals which have not received grants under the OCD-USPHS program are also preparing plasma reserves which total about 50,000 units. Plasma required for the treatment of war-related injuries may be obtained by any community through its Chief of Emergency Medical Service.

Mass Hysteria?

WHILE preliminary investigations by many officials have revealed such theories as "mass hysteria," and "mind over matter," the mystery of what caused 10 girl employees of a bathrobe manufacturing plant at 289 Nepperhan Avenue to collapse remains officially unsolved. DR. HARRY HEIMAN, of the Division of Industrial Hygiene of the State Labor Department, came here at the request of Health Commissioner Eugene F. McGillian to investigate the case, one of the most unusual in Yonkers police annals, according to Detective Captain Herman Schall, who directed police at the scene. Combustibles Department representatives and various inspectors from the Health Department also joined in the probe. The theory that some of the girls had eaten lightly at breakfast and luncheon and there-

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by were in a weakened condition was advanced by some authorities after questioning the girls and learning that a few admitted having had only "a glass of milk" for breakfast and a similar repast for lunch. . . . Captain Schall said that the proprietor of the plant, told him he manufactured bathrobes for the U. S. Army Medical Corps, for use of soldiers in hospitals. The girls were working as usual, he said when suddenly one of them fainted. Within two hours, the others collapsed one by one. Dr. Benjamin Criscitella, of Yonkers General Hospital, answered an ambulance call and treated the girls at the plant. . . . Officials checked the nearby Nepperhan Creek for odors but found the water at a high level, flowing freely. They report that sanitary conditions in the plant are good, that there is ample ventilation, that food poisoning was not a part of the case, and that the plant had no labor trouble or any reason to suspect sabotage. Dr. Heiman told officials he found no cause for the fainting spells except the possibility of "mind over matter" or "mass hysteria," with one girl fainting and others following her. This has happened on other occasions elsewhere, he said.

—Yonkers (N. Y.) Herald-Statesman.

Heat Cramps

LARGE amounts of vitamin C may be lost by people working in extreme heat because of the vitamin's water solubility and the loss of water which occurs through sweating. Since vitamin C is thought to be concerned with the tone of the large muscles, as well as the muscular coats of blood vessels, loss of tone of the muscles was felt to contribute toward collapse of the circulation. Thirty men were given vitamin C while working under conditions of extreme heat. Under these same conditions heat cramps and heat prostration had occurred in a number of men. Those who received large doses of vitamin C daily had no heat cramps and felt just as fit as when working under ordinary conditions. On the basis that vitamin B is also water soluble and could be lost through extensive sweating, these men were given vitamin B and salt in addition to vitamin C. This treatment is recommended for all workers who are exposed to extreme heat.

—Abbott's *What's New*, December, 1942.

Minnesota Health Program

IN MINNESOTA, in 1940, the Committee on Industrial Health and Occupational Diseases was formed in the State Medical Association. In 1939 the legislature passed an act requiring the reporting of occupational diseases and authorizing the State Department of Health to investigate and make recommendations for the control of industrial health hazards. Early in 1940 an Industrial Hygiene Unit was formed within the State Department of Health to carry out this function. In July, 1941, the status of the Industrial Hygiene Unit was changed to that of a full Division of Industrial Health. The general function of the Division is to offer a medical and engineering advisory service to assist industry in the many technical aspects of the control of industrial health hazards. The broad outline of its program is as follows:

1. To receive and investigate reports of occupational disease.
2. To promote more adequate medical services within industry, such as the employment of full-time or part-time physicians and nurses, the provision of properly equipped first aid rooms, and the maintenance of sickness records.
3. To encourage the use of ethical preemployment and periodic physical examinations.
4. To confer with industrial physicians in regard to special problems or general industrial health programs. Special blood and urine analyses for evidence of industrial intoxication will be made when warranted.
5. To provide engineering personnel who are specially trained and equipped to make studies of plant environment (*e.g.*, air analysis for toxic vapors, gases, and dust, in an effort to determine whether the working atmosphere is safe or otherwise) and to make recommendations for the control of health hazards found. These studies will be made at the request of physicians, plant managements, the State Department of Labor and Industry, and others concerned with the health and welfare of the industrial worker.
6. To promote within industrial groups adult hygiene programs, such as the control of tuberculosis, syphilis, and other communicable or preventable diseases.
7. To prepare and disseminate information on various toxic materials and processes, and methods for their control.

—L. W. FOKER, M.D., in "Minnesota's Industrial Health Program," *Minnesota Med.*, December, 1942.

Employee Cafeterias

DR. VICTOR G. HEISER, Medical Consultant for the National Association of Manufacturers, speaking at Rochester, New York, on November 17, before a Wartime Clinic on Health in Industry, took issue with

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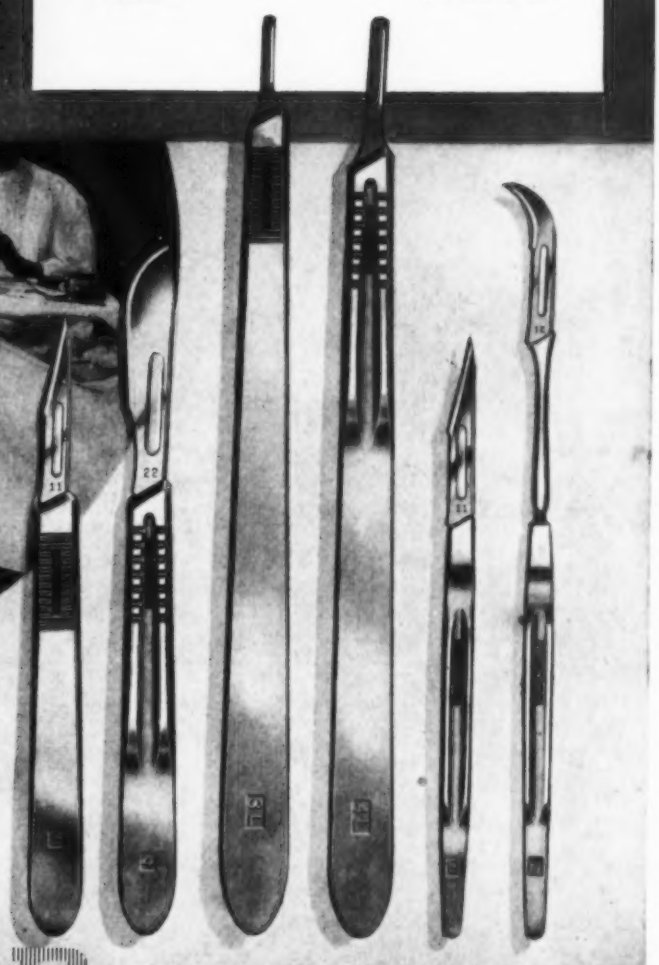

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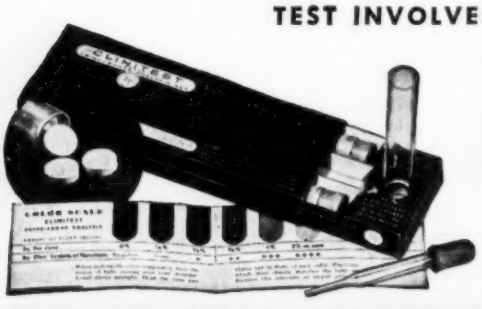

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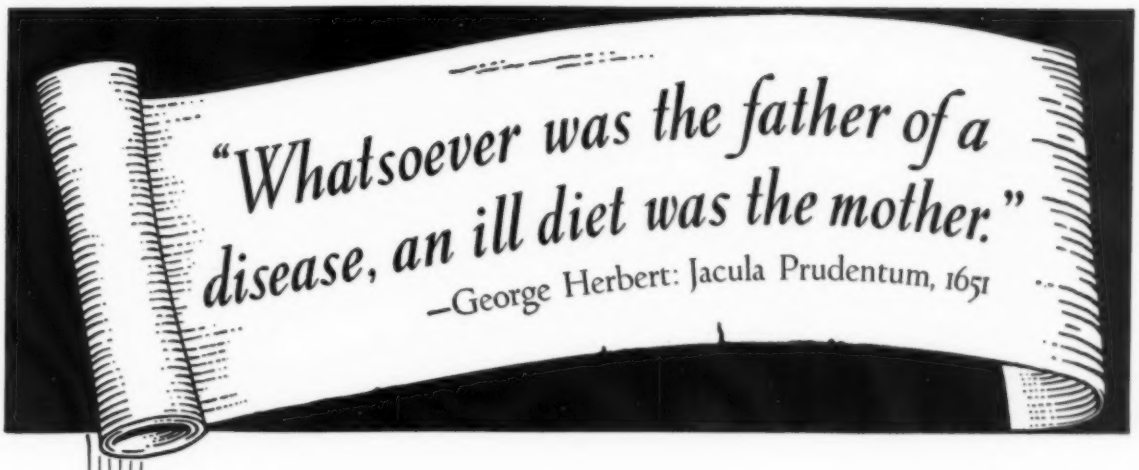
the statement recently made in London by Mrs. Eleanor Roosevelt that many United States factories belonged to a "by-gone age" in the matter of providing proper eating facilities for workers. DR. HEISER said that industry is making remarkable advances in providing both nutrition education and on-the-job eating facilities for workers. He referred to the recent "little dialogue" in London between Mrs. Roosevelt and Lord Woolton, British Minister of Food. Lord Woolton had said to Mrs. Roosevelt, "Any employer who doesn't look out for feeding his workers belongs to a by-gone age," and Mrs. Roosevelt had replied then, that many in the United States belong to a by-gone age. "I was rather sorry to read that Mrs. Roosevelt made such a remark," said DR. HEISER. "She probably did not mean to convey any sweeping indictment of industry on the score of providing eating facilities for workers, but as an admirer of exactitude in the use of the English language, I would say that her use of the word 'many' was most unfortunate. It is quite true that 'many' plants do not have cafeteria facilities; there are a number of reasons why this is not practical everywhere. But, to assure absolute fairness in the matter, I believe the good lady might also have pointed out that 'many' plants do offer good and reasonable eating facilities to their workers. To the best of my knowledge, there is no recent survey on the number of plants that maintain employee cafeterias. In October, 1941, however, the National Association of Manufacturers conducted a survey of 2,064 industrial establishments—an accurate cross-section of industry—and learned that 41% of them did maintain lunchrooms. It is a matter of common knowledge in industry that more and more factories are providing lunchrooms, or taking over management of cafeterias from outside sources, and I am quite certain that the percentage of plants with employee cafeterias would be at least 50% and probably higher today. I wonder if Mrs. Roosevelt really knows what American factories are doing in the way of nutrition programs for their workers, and in the matter of providing clean, comfortable, healthful and reasonable eating places for employees? I wish she could have been with me when I visited a certain plant in the East last year; this company had built a cafeteria that was a palace, and had turned it over, lock, stock and barrel, to the employees who were running it themselves. It was providing excellent luncheons for the workers—soup, meat, vegetables, milk and dessert—for only 12 cents. I wonder if she knows about the factory-operated cafeterias that put the proper healthful foods on the menus at cut prices in order to encourage employees to eat the right things? Or about another company I could name that has the practice of giving away some desirable dish for several days in order to get the workers accustomed to a proper diet? I could mention scores of instances that, if related in detail, would show that our American factories are not entirely living in a 'by-gone age.'"

The Cardiac In Industry

DR. RUFUS B. CRAIN, of the medical department, Eastman Kodak Company and DR. O. F. HADLEY, Surgeon, U. S. Public Health Service, spoke on the cardiac in industry at a meeting of the Committee on Cardiac Clinics of the New York Heart Association at the New York Academy of Medicine, December 1. DR. HADLEY discussed the general problem; DR. CRAIN, the placement of the cardiac in industry.

Industrial Solvents

DR. ALICE HAMILTON, internationally known health authority, delivered the fourth in a series of lectures on industrial health and medicine in war time being given by the Yale School of Medicine for the physicians of Connecticut. She gave detailed descriptions of the dangers involved and the correct methods necessary for the handling of industrial solvents, particularly those containing chlorine. "Formerly the only solvents the physician had to consider were naphtha, benzine, turpentine, wood alcohol, and coal tar benzol. Now wood alcohol is out of the picture, and turpentine is less important. However, a whole list of newer solvents has been produced, some of which are still only imperfectly known, so far as their action on human beings is concerned." Discussing the general nature of solvents in industrial chemistry, DR. HAMILTON defined a good solvent as



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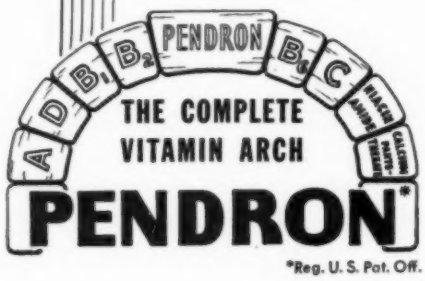

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"one that dissolves fats, oils, gums, and coatings efficiently and then dries quickly. Such a solvent, however, also acts upon the fatty substance in the central nervous system of man and produces effects similar to those of chloroform and ether, damaging the liver, kidneys and blood-forming tissues." Therefore, the very features which make a solvent best suited for industrial use also make it most dangerous to human tissue. "The quicker the solvent dries, the greater the contamination of the air of the workroom. There is, however, a wide difference in the toxicity of the solvents, and if one of the safer ones is chosen and good fume-removal installed—especially necessary if the solvent must be used hot—no harm need result to the workers."

Accident Mortality

THE ACCIDENT rate for the first nine months of 1942 is up from 50.7 in 1941 to 51.3 per 100,000, or 1.2%, according to the Statistical Bulletin of Metropolitan Life. This despite the fact that motor vehicle accidents, which normally account for about one third of the total, are down about 15%. Home accidents are up very little; the increase has occurred largely in the industrial accidents and in accidents in public places. The increase in industrial employment—perhaps two million since Pearl Harbor, and six million since the fall of France—has had its effects, especially since some of the persons entering the defense industries were inexperienced and, in the beginning, poorly trained. Also, the pressure for production of needed war materials may have caused some relaxation in safety precautions. The accidental deaths among the military personnel in training have also contributed to the total rise in the accident rate for the year.

Axis "Pays" Absentees

EMPLOYEES of the Columbian Steel Tank Company, Kansas City, Missouri, were startled recently to get two checks in their pay envelopes —one for days worked and the other for time absent from their jobs as making war materials. The check for not working was drawn on the "Bank of the Axis" and signed by "Adolph Hitler and Benito Mussolini." Across its face in red letters it read: "Negotiable in Human Lives." R. S. ROBINSON, public relation director of the firm developed the "check" as a means of discouraging absenteeism. Similar checks are now also used by other firms in the Middle West. The idea is to make out the check in the exact amount of money the worker loses by being away from the job. Some firms include a note explaining that the Axis partners would gladly pay them to stay home and thereby slow down production. The Columbian company reports a 27% reduction in absenteeism immediately after the first "checks" were issued. Other users report similar reductions. The form is produced and copyrighted by R. M. Rigby Printing Company, Kansas City, Missouri.

—*Printers' Ink*, December, 1942.

New Industrial Hospital

MANHATTAN Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, New Jersey, has a new 14-room industrial hospital, staffed by physician, five nurses, secretary, and clerk. The various rooms comprise reception hall, doctor's consulting room, first aid dressing room with a clerical alcove, supervising nurse's office, and an emergency ambulance entrance. Adjoining is a completely equipped surgery, and a physiotherapy room for post-injury care. This has infra-red apparatus, short-wave diathermy machine, heat lamps, two massage or treatment tables, foot tub bath and fracture table. For the examination of all new employees, there is a medical and history room with scale, eye test machine and record files. This connects with two individual examining rooms wherein are blood pressure machines and examination tables. Also included are an x-ray room and a full-size surgical supply sterilizer. Manhattan's workers are encouraged to visit the

—Continued on page 52.

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V-E-M can always be recommended as a pleasant relief for the stuffy noses of simple head colds and for other annoying nasal conditions often caused by the dry air of heated homes and buildings, quick changes in temperature, inhaled dust, soot, fumes, pollen and air borne droplets in crowded places. V-E-M soothes and lubricates the accessible nasal membranes, depositing a partially protective film; it quickly clears the nasal passages of temporary congestion; it sweetens the exhalation of breath through the nose; it softens crusty accumulations; in short—

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THE BENEFITS OF MULTI-VITAMIN PREPARATIONS AS REPORTED IN THE RECENT A. M. A. ARTICLE.[1]

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Dietary Deficiency SABOTAGE her!

As manpower becomes scarcer . . . the tendency is for every worker to work a little harder . . . a little longer. All of us have less time for everything . . . including meals. And, very often, these are nutritionally inadequate. Because of this, millions of war workers are suffering the detrimental effects of dietary deficiency. Only recently the Surgeon-General of the United States Public Health Service revealed the seriousness of this situation in this statement:[2]

> "Many persons without clinical evidence of disease are incompetent for the nation's need, and inadequate to meet their own problems because of various forms of malnutrition."

Efficiency, vigor and morale depend largely on proper nutrition. Since food habits are hard to change, the supplementary administration of vitamins considered essential is the simplest and most practical method of preventing vitamin deficiencies.

As a physician, you appreciate that a dietary deficiency can rarely be attributed to the lack of one vitamin alone. In most cases, a deficiency in one vitamin is accompanied by a deficiency in other vitamins. Symptoms caused by missing dietetic factors may be so mild at first as to escape detection. Therefore, it is safer and more desirable to prescribe a multi-vitamin preparation like VITULES as a nutritional adjuvant.

[1]Council on Pharmacy and Chemistry and Council on Foods and Nutrition: The Proper Use of Vitamins in Mixtures, J.A.M.A., 119:948:1942.
[2]Parran, T.: South. Med. J., 34:85, January, 1941.

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The Journal of Industrial Health, Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 12 | January, 1943 | Number 1

Carbon Tetrachloride

—In Industrial Hygiene—

WILLIAM H. EASTON, Ph.D.,
Safety Research Institute, Inc.

CARBON tetrachloride, being non-inflammable, non-explosive, and relatively inexpensive, is one of the most useful of industrial organic solvents. Its production was tripled during the decade from 1930 to 1940, and war conditions have still further increased its consumption. Hence, it is more important than ever to evaluate correctly the health hazards presented by this solvent.

One of the difficulties in making such an evaluation is that carbon tetrachloride, in common with many other organic solvents, is toxic in two different respects. Under certain conditions it acts as a simple narcotic, but, under other conditions, it exerts a secondary toxic effect.

These two effects, though generally recognized, are usually confused, and one of the objects of a series of studies by Lehmann and Flury[1] was to clarify this situation.

Narcotic Action

IN THIS research, the narcotic action of various organic compounds was studied by means of human experiments. Table I, compiled from the resulting data for some of the more commonly used solvents, gives concentrations that produced narcotic effects but no secondary poisonings.

For carbon tetrachloride, Lehmann's complete data are given in Table II.

TABLE I.
THE NARCOTIC EFFECT OF THE VAPORS OF VARIOUS ORGANIC SOLVENTS
(Maximum concentrations used in human experiments by K. B. Lehmann at al.[2])

Solvent	P.P.M.	Exposure—Minutes	Symptoms
Tetrachlorethane	330	10	Dizziness, flexing of the knees
Trichlorethylene	1,280	6	Dizziness, severe headache
Chloroform	4,100	Less than 7	Narcotic conditions
Carbon disulphide	3,000	30*	Vomiting, sensation of fainting
Methyl alcohol	5,000	Not given	Strong stupor, morbid sleepiness
Ethyl alcohol	5,000	Not given	Same as methyl alcohol but more severe
Benzol	5,000	15	Dizziness, sense of heat, limit of endurance by subject
Carbon tetrachloride	12,700	1	Paresthesia of extremities, unconsciousness, followed by euphoria
Acetone	—	—	Human beings said to endure 10-20 g. without disturbance

*Figure seems too high, as Lehmann says elsewhere[2] that 1,100 p.p.m. of CS_2 will produce severe symptoms with unconsciousness in half an hour.

TABLE II.
THE NARCOTIC EFFECTS OF CARBON TETRACHLORIDE VAPORS ON HUMAN BEINGS
(K. B. Lehmann[2A])

P.P.M.	Minutes	Effects	After-Effects
3,200	5	None	
4,800	2½	Slight stupor	Slight intoxication, giddiness
6,400	3	Oppression, heaviness, paresthesia of extremities, ringing in ears, stupor	After 5 minutes, slight headache
9,500	1½	Paresthesia of extremities, slight fainting	Return of consciousness after 3 minutes, euphorin
12,700	1	Paresthesia, unconsciousness	Euphoria, motor unrest, slight intracranial pressure after 2½ hours

It is evident, therefore, that exposures to carbon tetrachloride vapor concentrations sufficient to cause narcosis do not necessarily result in secondary poisoning. This conclusion is borne out by the following cases:

Circumstances	Consequences	Reference
Five men removed leaking tins of CCl_4 from poorly ventilated compartment of a ship	Two were anesthetized, as were the three others who tried to rescue them. All recovered, without lasting ill-effects.	4
Spinal dressing on a child was removed with CCl_4	She lost consciousness and had to be resuscitated by artificial respiration. No secondary poisoning.	5
Woman cleaned hair with shampoo containing 25.4% CCl_4	Lost consciousness. Recovered in 15 minutes.	6
Three men de-mothed clothing indoors with a preparation that was chiefly CCl_4	Became unconscious; discovered 40 minutes later. No serious after-effects.	7

DANGEROUS CONCENTRATIONS. The vapors of any volatile organic solvent are, of course, dangerous if high concentrations are breathed for too long a time. With carbon tetrachloride, according to Flury,[8] 5,000 p.p.m. endanger life within 30 minutes, and 50,000 p.p.m. will cause fatalities in five to 10 minutes. Henderson and Haggard[9] consider a concentration of 48,000 to 63,000 as dangerous to life for "brief" exposure.

Secondary Toxic Action

ACUTE EXPOSURE—Human experiments cannot be used in studying the secondary toxic effects following acute exposures to carbon tetrachloride vapors, and, when accidents happen, it is almost always impossible to obtain accurate exposure data. Of course, much work has been done with animals, but the results cannot be applied directly to human beings. Hence, the minimum conditions of concentration and time under which secondary poisoning will be produced in man by acute exposure to carbon tetrachloride vapors are still unknown.

Presumably, however, normal persons will run no grave risk by breathing the concentrations for the time given in Table II, though these data may not be applicable to persons who are unusually susceptible or have predisposing pathological conditions.

Serious cases of carbon tetrachloride poisoning have resulted from such exposures as the following:

Circumstances	Consequences	Reference
Man waxed a floor with a compound containing 48% CCl_4	Developed gastro-intestinal disturbances, nephritis, uremia, and pneumonia. Died on 15th day.	10
Mechanic cleaned an electric motor with two to four quarts of CCl_4 during a four-hour period	Eight hours later developed headache, nausea, chills, and vomiting. Returned to work in three weeks, but had fatal hemiplegia.	10
Man fumigated a small room by spraying CCl_4 on walls and stayed in room for two hours	Entered hospital 10 days later, primary injury apparently to kidney. Discharged in 26 days.	11
Cable splicer was exposed to CCl_4 vapors for 4½ hours in a manhole	Nephritis and impending toxic uremia, followed by recovery.	12
Boy purposely spilled CCl_4 on bedclothes and crept under them	Discovered unconscious 2½ hours later. Prolonged narcosis, liver enlargement, which disappeared within five weeks.	13

In a few cases cited in the literature, carbon tetrachloride poisoning has been ascribed to the use of vaporizing-liquid (carbon tetrachloride base) fire extinguishers. Such cases, however, are complicated by the fact that it is virtually impossible to inhale the fumes of carbon tetrachloride or any of its decomposition products while extinguishing a fire without also inhaling the smoke and gases given off by the fire, which are likewise toxic and are responsible for many deaths and injuries every year.[14] Olsen [15] doubts if extinguisher gases ever appreciably increase the toxicity of the atmosphere surrounding a fire and suggests that the lung injuries sustained in the well-known Portsmouth case[16] were caused by the toxic gases generated by burning clothing.

It is, of course, possible to build up a dangerous concentration of carbon tetrachloride vapors in a small, unventilated compartment by discharging into it the contents of a number of vaporizing-liquid fire extinguishers, but Gronow[17] states that the vapor given off from two liters of carbon tetrachloride (approximately equivalent to the contents of two one-quart vaporizing-liquid fire extinguishers) can be inhaled for several minutes without danger.

CHRONIC EXPOSURE—In classifying the organic solvents with respect to their health hazards under ordinary conditions of use in industry, where workers may be exposed to relatively low concentrations for long periods, Flury[2B] has the following to say:

"The only classification possible is a threefold one, namely the division into comparatively harmless solvents, solvents with considerable toxic effect, and finally, strongly toxic substances that are especially dangerous.

"The following substances are to be considered as comparatively non-toxic solvents that are not dangerous from a practical point of view, especially when the conditions under which they are used are taken into consideration: the majority of the difficultly volatile substances, e.g., from the glycol series; and, among the more easily volatile substances, the solvents of the benzine series, ethyl alcohol, ether, the intermediate acetate esters, and probably also acetone; and among the chlorinated hydrocarbons, dichlormethane, monochlorethylene, tetrachlorethylene.

"To the middle group belong the great majority of the solvents, the amyl compounds, the majority of the chlorinated hydrocarbons, such as chloroform, trichlorethylene, the benzol homologues, the chlorobenzenes, the hydrogenated cyclic hydrocarbons.

"The third group consists of the substances distinguished by an especially high toxicity and also by practical hazard: the methyl compounds, such as methyl alcohol, methyl chloride, dimethyl sulfate, tetra- and pentachlorethane, benzol, and carbon disulfide."

While carbon tetrachloride is not specifically mentioned by Flury in any of these three groups, from a statement made elsewhere[2C] he appears to consider it in the second group. He says: "Numerous cases of industrial poisonings (by carbon tetrachloride) are known. Serious and fatal cases, however, are comparatively rare, and the illnesses caused by inhalation are usually mild.

"As far as can be seen at present, the dangers from carbon tetrachloride when used as a solvent are not very great."

What may be considered "ordinary conditions of use in industry," in the case of carbon tetrachloride, are exemplified by Smyth's measurements of the concentrations of this solvent in the air of 48 factories.[18] He found average continuous exposures of all values up to 117 p.p.m., and peak exposures, lasting usually less than a minute and never more than half an hour, that averaged 356 p.p.m. and had a maximum of 1,252 p.p.m.

Smyth also studied the workers who handled carbon tetrachloride in these factories, and, on the basis of this work supplemented by extensive animal experimentation, he concluded that 100 p.p.m. of carbon tetrachloride vapors in the air is a safe concentration for continuous exposure of workmen throughout the day, and day by day, and that 1,000 p.p.m. is safe for periods up to half an hour provided the day's average does not exceed 100 p.p.m.[18]

These figures are generally accepted as industrial safety standards.

Compensation Claims

IT APPEARS impossible to arrive at any very definite conclusions as to the frequency of carbon tetrachloride injuries from the records of compensation claims. A study of reports from 41 states, for the period 1940-41, shows that many states have no provision for such types of compensation; others class all claims due to toxic substances under a single heading, such as "Industrial Poisons."

The U. S. Public Health Service[19] has tabulated the results of investigations of 1,536 cases of industrial illness which were reported during 1940-41. Of these 1,536 cases investigated, 41 were due to organic solvents, three of them to carbon tetrachloride.

The reports from three highly industrialized states, for the period 1940-41, list the following carbon tetrachloride compensation cases: Pennsylvania, 9 in 1940; Ohio, 8 in 1941; Wisconsin, 1 in 1940.

The Ohio record gives some understanding of the degree of injury involved in the eight cases claimed against carbon tetrachloride in the summary of time lost, although the report does not indicate whether these were for "acute" or "chronic" exposures:

No. of Claims	No. Days Lost
2	None
2	3
1	14
1	21
1	30
1	56

Apparently the lack of exact information in the compensation records arises, in large part, from the difficulty of recognizing the effects of the various solvents on the human system, which is pointed out by the U. S. Public Health Service.[19] Flury too[2D] points out that "because of the extraordinarily great degree to which the symptoms of the various poisonings coincide, the recognition of a poisoning due to solvents is very difficult for the physician. . . . This is true for acute forms and much more so for chronic cases."

References

1. LEHMANN, K. B., and FLURY, F.: Toxicology and Hygiene of Industrial Solvents. Trans. by KING, E., and SMYTH, H. F., JR., from 1st (1938) German edition. 2A. Same, p. 125. 2B. Same, p. 276. 2C. Same, p. 128. 2D. Same, p. 65.
3. LEHMANN, K. B.: quoted by Browning, E., Toxicity of Industrial Organic Solvents. Chem. Pub. Co., New York, 1938, p. 364.
4. HAIGLER, F. H.: *J. Ind. Hyg.*, September, 1932, p. 168.
5. CHANDLER, F. A.: The Use of Carbon Tetrachloride in Removal of Adhesive Tape. *J.A.M.A.*, v. 107, p. 2121.
6. DESOILLE, H., and ANTOINE, G.: *Ann. Med. Leg. Criminol. Sci.*, v. 16, p. 155.
7. BOBBERS, H.: *Samml. Vergiftungsfallen*, v. 9, p. 37.
8. FLURY, F.: Mod. Ind. Poisoning. *Arch. Exp. Path. W. Pharmakol*, 1928.
9. HENDERSON, Y., and HAGGARD, H. W.: Noxious Gases. Chem. Cat. Co., 1927, p. 160.
10. HAYHURST, E. R.: Rep. Proc. 8th Inter. Congress for Accident Medicine and Ind. Diseases, p. 1180.
11. YOUNG, C.: Carbon Tetrachloride Poisoning. *J. Can. Med. A.*, v. 35, p. 419.
12. DAVIS, G., and HANELIN, H.: Carbon Tetrachloride Poisoning. *Ind. Chem.*, v. 6, p. 24.
13. ALLISON, B. R.: Treatment of Acute Carbon Tetrachloride Poisoning. *Ann. Int. Med.*, v. 16, p. 81.
14. EASTON, W. H.: Smoke and Fire Gases. *Indust. Med.*, October, 1942, v. 11, p. 466.
15. OLSEN, J. C.: Formation of Phosgene in Thermal Decomposition of Carbon Tetrachloride (discussion). *Ind. & Chem.*, v. 25, p. 539.
16. HAMILTON, A.: Industrial Toxicology. Harper, New York, 1934, p. 9.
17. GRONOW, W. E.: *Zbl. Gewhyg.*, v. 14, p. 161.
18. SMYTH, H. F., SMYTH, H. F., JR., CARPENTER, C. P.: Chronic Toxicity of Carbon Tetrachloride. *J. Ind. Hyg. & Tox.*, May, 1936, v. 18, No. 5.
19. U. S. Public Health Report No. 23.

Dental Ill-Health

—In Relation to Absenteeism—

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TURNING to the medical causes of absenteeism, they are to some extent a category of the ills that flesh is heir to. So much has been written about them that it is unnecessary for me to do more than call your attention to the relations of each to the other and their respective proportions in general. In INDUSTRIAL MEDICINE, for September of this year, there was shown the last published report of the U. S. Public Health Service on the estimated annual number of days lost from work or other usual pursuits by reason of specific chronic diseases. This was for 1937, but it probably does not differ in any material respect from a similar compilation for the current year, either as compared to the population or with reference to the relative status of each specific disease. The total of days lost was 697 million. Relating this to the 100 million people in the country likely to have work or other usual pursuits — even such perhaps as going to school—the routine of the entire country suffered about 2½% of absenteeism from chronic ailments. It would be reasonable to add another 1½% for acute conditions, such as the common cold. This would make 4% of the habitual effort of the aggregate population inhibited by sickness each year. If we apply that ratio to the nearly 18 million now engaged directly in war industries, it would mean that about three-quarters of a million people are continually absent from their war work every day of the year on account of either acute or chronic illness. Thus we can arrive at our own conclusion that somewhat more than half of the total of absenteeism in industry is due to medical causes. . . .

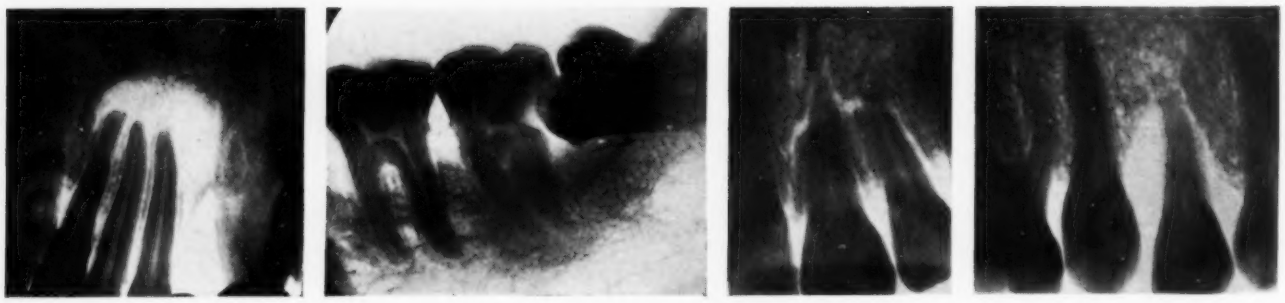
NOW as to these causes themselves. In the table to which I referred there are 28 classifications, beginning with 132,500,000 days lost on account of nervous and mental diseases, and ending with 3,300,000 days lost on account of diseases of the prostate and male genito-urinary organs. No mention is made of dental conditions.

This omission is characteristic of practically all statistical summaries of the medical causes of absentism. Only once have I come across dental conditions named and included as such in any list of the kind. This was in a survey by FORSTER and LEEDKE of non-occupational illnesses and injuries in an oil refinery. In that survey two cases of dental conditions were identified as responsible for 20 days of lost time. Interesting in connection with this was the statement that one of the five cases which were classified as genito-urinary began in a dental condition, and was so classified because it was "the kidney lesion which prolonged the disability from which the employee was suffering."

There may be other instances of the direct acknowledgment of dental conditions as causes of absenteeism. The one mentioned, however, is sufficient at this time. It came from a small employment situation, but its significance is as forceful as if it were from the largest industry in the country.

As physicians of long experience, you are familiar with the toxic possibilities from a diseased mouth. You know, for example, how often a genito-urinary condition has its origin in a pus pocket in the jaw. The relation in this particular instance is close, and is constantly suspected. This is very well known to genito-urinary specialists. Indeed, one of the outstanding G-U men of this locality makes it his rule that every patient who comes to him must immediately undergo a thorough check-up and clean-up of his mouth. And as physicians you also know how many other conditions there are from which it is impossible to exclude a diseased mouth as an etiological factor. It will be profitable to consider some of these in the light of the two tabulations previously mentioned. In the small table there were *two* admittedly "dental conditions" and *a third* in which the dental condition was acknowledged as part of the etiology. This gives us a known etiological ratio of one to three. In the larger table the causes of absenteeism in which dental conditions might have been etiological are nervous and mental diseases, rheumatism, heart disease, arteriosclerosis and hypertension, ulcers of the stomach and duodenum, anemia, diseases of the bladder and urethra, chronic appendicitis, and certain diseases of the eye, and of the genito-urinary and prostatic functions. The total number of days lost from these causes in 1937 was more than 420 million. If we apply this etiological ratio in the small situation to the population as a whole we have about 140 million days lost every year from chronic causes which had their origin in dental condi-

From the text of DR. HOOPER'S presentation on "Mouth to Mouth Absenteeism," at the Mid-Winter Scientific Session of CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY, Chicago, December 11, 1942.



ABSENTEEISM POTENTIALS

Left to right: (1) Considerable absorption and large rarefied area around apices of lower anterior teeth extending up to interproximal space. (2) Impacted lower 3rd molar causing caries in 2nd molar—its eventual destruction. Also shows deep pockets, process destruction, and calculus deposits. (3) Shows pockets and absorption; also rarefied area at apices of superior anterior. (4) Shows large deep pocket condition around 1st bicuspid, with considerable destruction of process.

tions. If we apply the same ratio to the industrial population we have at least 20% of industrial absenteeism coming from the same beginning. This is only the chronic.

In industry, the absenteeism from acute mouth troubles is undoubtedly as much more.

If there is any objection to this method of measuring the effects of dental conditions in relation to the problem of absenteeism, the answer must be that it is the only method now available. Until the statistics on dental conditions are as carefully gathered in respect of themselves as they are in respect of their sequelae, we can do no better.

What we have, however, is adequate for the purpose of emphasis. The trouble with it is that it is all a possibility as we look back upon it, and a potentiality as we think of it in the future.

As to the past, we can't go back. We can't head off an existing ulcer or an arthritic infection by cleaning up now the diseased conditions that began their destructive after-effects perhaps years ago.

But we *can* head off the potential. First, however, let us examine it. No doubt there will be nothing new in the slides I am going to show. I will ask you, however, to examine them with me in terms of the fact that *any one* of the conditions here illustrated *may be* the principal etiological factor in *any one* of the chronic diseases previously named. . . .

As to the conditions I have shown, as well as to the many more there isn't time to illustrate, we can't know which one is going to cause which chronic disease. All we are sure of is that each one *can* cause any of the chronic diseases named. We are sure that each one *can* because each one *has*. And so we are permitted to accelerate the potential, and conclude that inasmuch as each one *has*, each one *will again*. . . .

SINCE organized medicine started to get interested in industrial medicine, the constant injunction has been "prevention." The new term for it is "industrial health." In this phrase it is always before us, ubiquitous in what we hear and in what we read. But what is "industrial health?" In the individual employee, it is the absence of ill health—which is another way of saying that it is the result of applied prevention.

In thinking of prevention as applied to the industrial population—those who make up the total from which the absentees are absent—it seems more than strange that so much consideration is given to the employee's objective hazards, and so little to the subjective which he is carrying around with him. The lead hazard is brought under control, the hazards of toxic substances are met and ameliorated, the gases and fumes are exhausted, the external risks are safeguarded—yet the pus hazard, the slow destructive toxicity that saps and enervates, on its steady way to one of its many and protean chronic manifestations, is passed along with only casual notice.

It may be said that dental conditions are not overlooked or ignored in employee physical examinations. That is true—so far as it goes. But it doesn't go far enough. How many industrial medical departments include dental x-rays as part of such examinations? Very few, indeed. Yet every dentist will tell you that, short of an x-ray, the best opinion as to the health of any man's mouth is only superficial. . . .

IT SEEMS to me that "prevention" is by way of becoming a catch-word, instead of a rule of action. The field of dental service in industry holds out an opportunity for the kind of prevention that will actually *prevent*. Every mouth that is thoroughly examined and put in order prevents a future disease in terms of a present clean-up. And there is no kind of prevention that can be more easily, more cheaply, and more effectively provided. It is my opinion that every physician who examines an employee's mouth ought to do it as a matter of diagnosis not alone of the mouth but also of all the diseases than can have their etiological roots in the condition of that mouth. When he does this he will be practicing preventive medicine in the highest preventive degree. . . .

In these times when every possible hour of work on the part of every possible employee is almost vital to the war effort, prevention is more necessary than ever before. Employees are being urged and almost bombarded into a number of things. It is a rare bulletin board in a plant that isn't covered with posters on safety, nutrition, and many other things that it is felt ought to be continually in the employee's attention. There are plans in the making now to add posters on dental health. I believe, however, that posters too quickly lose their effectiveness. The urge to go to the dentist is better implanted by word of mouth, and the gentle nagging of a considerate nurse is indispensable to the follow-up. Experience points to the conclusion that it takes repeated words *from* the mouth to obtain proper care *of* the mouth. In so far as absenteeism can be prevented by general hygiene or dental hygiene the insurance that it will be so prevented is a mouth-to-mouth proposition.

The average workman will usually neglect his teeth until they begin to hurt him. Without doubt every industrial nurse will tell you that he will get them taken care of, *if he is sufficiently urged*. I will venture even farther than this, to say that if he is shown an x-ray of his teeth, and has it explained to him, he will get them corrected with very little urging. I have found this to be true in my own somewhat extensive experience. . . .

THE country as a whole is fortunate in the fact that the concentrations of service men in the numerous camps, and of industrial employees in the numerous manufacturing localities have, so far at least, been unproductive of epidemics. I have in mind particularly trench mouth, which was a matter of great concern in the first world war. I know because of my own experience in that war, where it was part of my duty to treat many hundreds of cases. At that time the treatment was difficult and the disease often got out of hand. Probably the comparative freedom from it, so far in this war, is due to better hygiene to head it off, and better treatment when it is encountered. At least that seems to be the case in the Army and Navy. I am apprehensive, however, lest it begin to appear at any time in the industrial centers, and particularly in the larger cities. Unless it is checked it will inevitably spread. In my own practice I am finding a slowly increasing number of cases, but the rate of increase is not alarming. In my treatment of these cases I have been thus far uniformly successful in the use of silver nucleanate, commonly known as argyrol, which I find to be simple, quick-acting, and positive. This may be nothing new, but I haven't yet found any other dentist or medical man who is using it at the present time. I mention it, hoping some of you may find it valuable in the event you have an outbreak among the employees in your charge. . . .

IN CLOSING I shall not attempt to summarize what I have been trying to say, but instead will tell you what I think it means:

First, if you will make a dental survey of your employees, x-raying the mouths of every one of them, and having the pictures read by your consultant, you will find a startling need for preventive measures.

Second, if you will apply these necessary preventive measures forthwith, you will very quickly observe a decrease not only in your absenteeism from work, but also in the visible effects of fatigue during work.

Third, if you will include dental x-rays as necessary parts of all your physical examinations of employees, you will enter into an appreciation of the significance of preventive medicine which will be a new chapter in your experience.

Low Back Pain

—Some Anatomical Considerations—

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IN THE latter part of the last century, most cases of low back pain were classed under the heading of "railroad spine" and after the various compensation boards became established the condition became rapidly popular. In the beginning of the present century all the attention to the mechanism of low back pain was centered in the region of the base of the spinal column, in the lumbosacral and sacro-iliac joints. Along with this naturally became included all the cases harboring congenital anomalies of the lower spinal column, as spina bifida occulta, lumbarization and sacralization of the lowest vertebral bodies, separate neural arches and spondylolisthesis. These entities we now feel are frequently associated with low back pain, but are not necessarily the direct cause of it. More recently we have tended to discard this older "horizontal classification" and have adopted a "vertical classification" for the etiology of low back pain.[1] This vertical classification includes the anterior and posterior nerve areas of the lowest spinal nerve segments. Danforth and Wilson[2] first emphasized some important points in the anatomy of the lumbar spine. They found that the lumbar intervertebral foramina became increasingly smaller from the first to the fifth, while the corresponding nerve roots increased in diameter, the fifth lumbar nerve being the largest. Furthermore, the fifth lumbar root lies just anterior to the posterior articular facet between the fifth lumbar vertebra and sacrum, and any narrowing of the fifth lumbar intervertebral disc by compression causes a hyperextension of the spine with additional compression of the fifth lumbar nerve root. Perhaps this is a penalty that man has to pay for assuming the upright position. Recently Steindler[1] has emphasized the importance of the sinuvertebral nerves first described by Luschka in 1850. These are small nerve fibers made up of a white ramus from the peripheral nerve and a gray ramus from the sympathetic chain just outside the intervertebral foramen. This nerve turns back into the intervertebral canal and goes to the pedicles, the loose areolar tissue of the extradural space, the veins, the periosteum and the interior of the vertebral bodies. It is felt that they transmit the feelings of intraspinal irritation with a wide area of paresthesia as is seen so commonly in spinal arthritis. Steindler believes that these nerves do not receive sufficient consideration in dealing with the problems of low back pain. He further contends that a larger percentage of cases of back pain are of purely reflex origin involving these sinuvertebral nerves and are not due to direct compression in the intervertebral canal as is generally believed.

In accordance with the generally accepted present-day classification of causes of low back pain, I should like to divide them into three general groups: (a) the extraspinal lesions, incorporating the organs and tissues outside the spinal column; (b) the spinal column lesions; and (c) the intra-spinal lesions, which include all structures within the spinal canal. It is of utmost importance that all cases of low back pain should have the benefit of carefully made stereoscopic x-rays of the lower spine and pelvis, using all the various positions necessary to procure the necessary information. I also consider it of primary importance that the patient be given a complete general and neurological examination to determine any relationship that may exist between the low back pain and systemic disease.

Extra-Spinal Lesions

MUSCLE SPRAINS. These are of common occurrence and ordinarily are diagnosed easily by the localized tenderness and muscle spasm around the site of injury and the ready relief obtained by immobilization—strapping of the part and bed rest.

SACRO-ILIAC SPRAINS. These are due to sudden twisting movements associated with alterations in weight bearing. In a large percentage of cases there is radiating pain in the sciatic nerve distribution. There is marked tenderness over the joint involved and any manipulation exaggerates the pain. Various tests have been devised to facilitate in making a correct diagnosis:

(a) Gaenslen "leg flexion test." Patient lies on his back and holds the uninvolved knee flexed on his abdomen. Examiner then presses down on the extended leg. Severe pain follows in the involved joint.

(b) Goldthwaite "straight-leg raising test." Patient lying on his back, he raises the uninvolved straightened leg as high as possible and this height is noted. On attempting to raise the involved side leg,

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he can raise it only 50-60% as high or even less. Breck has added to this his "pelvic rotation test," to distinguish between sacro-iliac and lumbosacral joint involvement. The patient lies flat on his back and flexes both knees on the abdomen. The examiner then places one hand beneath the patient at the level of the lumbosacral junction and the other arm under both flexed knees and with the arm under the knees, rotates the pelvis on the spine. This test is essentially negative in sacro-iliac disease, but gives pain and muscle spasm in lumbosacral joint disease. The Goldthwaite straight-leg raising test is essentially negative in lumbosacral disease. Both conditions are treated by immobilization.

TIGHT TENSOR FASCIA LATA BAND. The contracted tensor fascia band pulls on the iliac crest, tilting the pelvis forward and causing adduction contracture of the femur, resulting in a tremendous leverage action on the sacro-iliac and lumbosacral joints, and so produces pain. In performing the Ober test[4] for this diagnosis, the patient lies on his side opposite the involved leg with both legs partly flexed. The examiner stands behind the patient and grasps the involved side ankle and extends the hip. Normally, the weight of the leg should cause the knee to drop toward the table. If fascia lata band is tight, the knee remains elevated and any attempt to push it downward (adduction) precipitates pain along the band and into the back. Treatment consists of dividing the anterior fibers just above the trochantor of the femur.

PELVIC DISORDERS. Various inflammatory diseases of both the male and female pelvis give pain in the back in the acute phase of the disease. I shall refer to the mechanism of this type of pain in the discussion of Spiller's syndrome later.

Spinal Column Lesions

SPINAL ARTHRITIS. This occurs most commonly in the older age group of patients. As a result of the immobility produced by the arthritic process the patient shows a loss of the normal lumbar curve and a rigid spine. The pain produced is usually periodic, depending on weather conditions and mechanical factors. The distribution of the pain is over wide zones of spinal segments with associated hyperesthesia. Steindler believes this is the classical example of pain produced by involvement of the sinu-vertebral nerves in the spinal column and canal. The treatment on the whole is rather unsatisfactory but consists in the main in the application of local heat and rest. Successful local nerve injection with novocaine or alcohol can be carried out in experienced hands.[5]

METASTATIC MALIGNANCY. In more direct contrast to spinal arthritis, the pains that are associated with metastatic malignancy of the spine are fairly constant and confined to a fairly narrow zone of segmental distribution with associated hyperesthesia. Wolfson *et al*[6] have clearly elaborated on the early diagnosis of metastatic malignancy and point out the elevation of blood phosphatase even before any visible changes by x-ray. The blood sedimentation rate is also frequently elevated. It is also well known that if localized back pain is not relieved by morphine sulfate, gr. ¼, one should consider malignancy as a likely cause. Treatment of the condition is most successful by deep irradiation if diagnosis can be made early.

FACET SYNDROME. Ghormley[7] has popularized this phase of low back pain and believes it is the most common cause of lumbosacral pain, with or without sciatic pain. The articular facets are the only true joints of the spinal column and the syndrome is a true traumatic arthritis. The pain is the result of a "locking" of the joint surfaces together brought about by twisting or rotary strains most commonly occurring at the lumbosacral joint region. The diagnosis is proved by well taken x-rays that show a mal-alignment of the facets involved. The acute phase is best treated by bed rest and immobilization to overcome muscle spasm. Most cases respond to conservative treatment, but the protracted cases require lumbosacral ankylosis by bony fusion as suggested by Ghormley.

FRACTURES OF THE SPINE. These usually follow direct trauma with resulting compression of vertebral bodies and fragmentation of facets and transverse processes. The pain is sharply localized to the injured area and can best be demonstrated by the Soto-Hall test[8] which can be done easily without disturbing the patient. With the patient flat on his back the head is acutely flexed, bringing the chin onto the sternum. This precipitates the pain at the involved level and is not found in cases of soft tissues injury with low back pains. The treatment is immobilization in extension.

Intra-Spinal Lesions

THE location of the lesion in this category involves the nerve roots of the cauda equina directly with more demonstrable evidence of neurological changes. Lumbar puncture should be performed in all cases in which an intraspinal lesion is strongly suspected to obtain all confirmatory evidence possible. The initial spinal fluid pressure should be measured with a manometer, and then the Queckenstedt test (jugular compression) carried out to determine any evidence of block in the spinal canal. If the lesion is located caudal to the point of puncture, a "reversed" Queckenstedt can be carried out by forceful injection of sterile saline through a needle placed into the caudal extradural space. The fluid removed should be examined carefully for its cell content and total protein as well as a special test for syphilis. For most conclusive diagnosis, myelography can be carried out, either with the intraspinal injection of air or lipiodol or thorotrost. The more one becomes familiar with the diagnosis of low intraspinal lesions, the less necessary myelography becomes. However, I do believe that flat x-rays should be made in all cases.

MENINGORACHIDIAN THROMBOSIS AND PHLEBITIS. This is a relatively new concept of intra-spinal disease and was first described by Temple Fay,[9] giving it the name of Spiller's syndrome, in honor of his teacher. Its pathology, as the name implies, is an inflammation of the venous plexuses in the epidural space. This process can be primary in the lumbar area, or extend from infection in the pelvis and lower extremities on the one hand, or downward from thoracic or head infections as Batson[10] has so well demonstrated. The condition is suspected in association with the picture of infection in the body and finding of the focus plus an increased sedimentation rate of the blood corpuscles. The neurological findings are those of segmental pain with sensory and motor alterations and a slowly progressing atrophy of the limbs whose nerve roots are involved. The treatment is that of bed rest with intensive therapy of the infection by vaccines and the sulfonamide group of drugs. Operations on the spinal column are not indicated.

RUPTURED INTERVERTEBRAL DISC. This phase of the problem of low back pain has gained much prominence since it has fallen into the hands of neurological surgeons with their careful methods of examination. In fact, it has become such an outstanding cause for low back pain that one famous neurosurgeon has implied that constant low back pain is either due to vertebral disc or is phychogenic in origin. I'm afraid I cannot

subscribe to such a view. The pathology of the ruptured intervertebral disc is so well known by now that I shall omit its discussion here.

In examining a patient suspected of having a ruptured disc, I consider it very important to make a complete and detailed neurological examination for two reasons: (a) the back pain may be part of a generalized process of neurological spinal disease and can only be properly evaluated in association with the complete findings; (b) in testing motion and sensation of the upper extremities and trunk, the patient learns how to compare the testing of the both sides of his body and extremities, so that he becomes more helpful in detecting minor differences in the lower back or extremities.

In the interpretation of the neurological findings, we find tenderness over the spinous process of the vertebral level involved. In the case of the disc being at the L-5 spine, this tenderness extends laterally and into the sacro-iliac joint on the side involved, so that if careful extent of the tenderness is not determined one may err in a diagnosis of sacro-iliac joint disease. Goldthwaite's straight-leg raising test is positive in both conditions. A test for differential diagnosis lies in noting tenderness in the sacro-spinalis and multifidus muscles that lie between the sacro-iliac joint and the lumbar spinous processes. Thumping this area with a reflex hammer at the level of nerve involvement by a disc usually gives radiating pain into the leg. Another confirmatory test for a ruptured disc is a unilateral jugular compression with the patient standing. This increases the intraspinal pressure and exaggerates the already existing pressure caused by the disc. Failure of this test by no means outlaws the presence of a vertebral disc, however. More final conclusive diagnosis can be made by myelography, with either air, lipiodol or thorotrast. The treatment is by removal of the disc fragment and associated hypertrophied ligaments by a hemi-laminectomy.

ARACHNOIDITIS. This condition seems to be becoming more common, perhaps due to its more frequent recogtion. The arachnoid membrane covering the spinal cord and its nerve roots becomes thickened due to inflammation with resulting constricting and adhesive bands and even pseudo-tumor formation with cystic collections. The diagnosis is usually made only at operation. Treatment is not very successful unless a cystic collection of fluid is the sole cause of the disturbance.

TUMORS. Tumors of the cauda equina must always be considered a likely cause of low back pain and sciatica, particularly if the condition is becoming progressively worse with associated neurological changes. The treatment of these is surgical, and the success of treatment depends primarily on the type of tumor and the extent of involvement.

Sciatica

SOME recent writers are now beginning to voice opinion that it is doubtful that a pure sciatica as such actually exists. I am unable to express an opinion on this view. However, in closing, I should like to leave with you a simple anatomical classification of sciatica as devised by Wilfred Harris, of London.[11] He divides sciatica into two types, low sciatica and high sciatica.

(a) In low sciatica, the lesion is situated at the sciatic notch region. The patient, on standing, leans toward the affected side and the Achilles jerk is absent due to inclusion of S-1 nerve segment.

(b) In high sciatica, the lesion is usually in the neighborhood of the L-4 and 5 intervertebral foramina. The patient leans away from the affected side. The Achilles jerk is usually preserved, particularly if S-1 segment is not involved in the lesion. This anatomical basis is not always as simple as given, but serves as a helpful guide in many cases.

The suggestions and discussion I have given in the differential diagnosis of low back pain can not be comprehensive in such a paper but are intended only as helpful guides in dealing with this problem.

Bibliography

1. STEINDLER, A.: Differential Diagnosis of Pain Low in the Back. *J.A.M.A.*, 110: 106, January 8, 1938.
2. DANFORTH, M. S., and WILSON P. D.: Anatomy of Lumbosacral Region in Relation to Sciatic Pain. *J. Bone & Joint Surg.*, 7: 109, January, 1925.
3. MULTNER, L. J.: Low Back Pain: Study of 525 Cases of Sacroiliac and Sacrolumbar Sprains. *J. Iowa M. Soc.*, 20: 473, October, 1930.
4. OBER, F. R.: Back Strain and Sciatica. *J.A.M.A.*, 104: 1580, May 4, 1935.
5. GREENE, M. B., and PIERSON, H.: Newer Methods of Diagnosis in the Treatment of Pain: Technique and Therapeutic Indications. *Anesth. & Analg.*, May-August, 1936.
6. WOLFSON S. A., REZNICK S., and GUNTHER L.: Early Diagnosis of Malignant Metastasis to the Spine. *J.A.M.A.*, 116: 1044, March 5, 1941.
7. GHORMLEY, R. K.: Low Back Pain. *J.A.M.A.*, 101: 1773, December 2, 1933.
8. SOTO-HALL, R., and HOLDEMAN, K. O.: A Useful Diagnostic Sign in Vertebral Injuries. *Surg., Gynec. & Obst.*, 61: 827, December, 1935.
9. FAY, T.: Epidural Ascending Spinal Paralysis (Spiller's Syndrome). *Tr. Am. Neur. Assn.*, 63: 47, 1937.
10. BATSON, O. V.: The Function of the Vertebral Veins and Their Role in the Spread of Metastases. *Ann. Surg.*, 112: 138, July, 1940.
11. HARRIS, W.: Sciatica and its Treatment. *Brit. Med. J.*, 2: 1245, December 17, 1938.

Toxicity of Gallium

—An Exploratory Investigation—

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WAR necessity has shifted a number of relatively obscure metals into a fair degree of industrial application. Indium is a forthright example of a little known metal passing into the class of "useful metals," which grouping is confusing and now merits abandonment. In the course of an investigation of the physiologic properties of indium,[1] opportunity arose for a limited and casual inquiry into the possible toxic action of a rarer and much less used metal—gallium, and one of its compounds—gallium nitrate. The latter was selected solely on the basis of availability and water solubility. Since gallium stands intermediate between aluminum and indium in the periodic table it conceivably follows that its physiologic activities might partake of those of the essentially innocuous aluminum or, instead, those of indium, which, under some laboratory circumstances but apparently not industrial applications, are exquisite and somewhat peculiar.

The only warrant for recording the findings from a small number of elementary experiments with gallium derives from the failure to locate in toxicologic literature citations to substantial published material other than one French item dealing with the use of gallium salts in the treatment of experimental syphilis and trypanosomal diseases. Levaditi, Bardet, Tchakirian, and Vaisman[2] introduced under varied laboratory arrangements gallium in the form of the tartrate, oxide, benzoate and anthranilate. Being insoluble in water the oxide, benzoate and anthranilate were suspended in oil or were dissolved in an isotonic solution of glucose. The tartrate possesses a measure of solubility. The dosage ran from 30 to 45 mg./kg. intramascularly and 15 mg./kg. intravenously. Apparently such doses were effective against syphilis and smaller

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doses against trypanosomae. Up to 15 mg./kg. apparently were tolerated without harm to laboratory animals.

After other preliminary description the results of our own limited inquiry will be shown.

Nature, Properties, Compounds and Uses of Gallium

GALLIUM (Ga), is one of three elemental metals that are liquids at and below the temperature of the human body, having a melting point of 29.7° C. Other common constants are at. wt. 69.72; valence 3; sp. gr. 5.9; b.p. 1600 C. This metal is greyish in color, hard, lustrous, and only slightly malleable. When molten it appears like tin or silver and may remain molten after passing its theoretical freezing point. It is insoluble in water but soluble in weak hydrochloric acid and some hydroxides. Unlike some metals it is only slightly volatile at red heat. It was discovered in 1875 by Boisbaudran. Its existence was predicted prior to its actual discovery. The name "gallium" is the Latin term for France, the metal being named by its discoverer in honor of his country.

Gallium is one of the scarcest of the elements but is widely distributed in minute quantities. Its largest amount, but still in minute traces, may be found in zinc blendes, the richest approximating only 0.016 gm./kg. Some gallium has been found in meteoric iron, and spectroscopic analyses indicate its presence in the sun and stars.

Gallium finds use as a substitute for mercury in higher range thermometers, in dental fillings, as a minor constituent of alloys, and as a catalyst.

Gallium compounds are like those of aluminum. While many are possible the commoner ones are: the bromide, the chloride, the hydroxide, iodide, nitrate, oxide, sulphide, sulphate, together with many organic compounds. Of the inorganic compounds here mentioned only the nitrate and sulphate are freely soluble in water. For extended chemical compilations see Mellor.[3]

Test Materials

A FEW grams each of metallic gallium (substantially pure) and gallium nitrate were available to this study. Solutions of gallium nitrate presented a pH of approximately 2.5 which obviously were unsuitable for physiologic studies. However, on buffering with citric acid a stable solution may be secured with a pH ranging between 4 and 7. It is probable that some gallium citrate thus was associated with the nitrate. For application purposes there were on hand the metal, the nitrate (a deliquescent salt), buffered solutions of the latter, in such concentration as 2 mg./ml. and 50 mg./ml. In the last mentioned the amount of gallium as such per ml. approximated 13.6 mg. With these preparations patch tests were carried out on the unbroken skin of humans, unbroken and abraded skin of rabbits, varied intravenous introductions in rabbits, and subcutaneous injections in rats and rabbits. The method of patch testing was that described in an earlier publication.[4]

Results

SIXTY-FIVE varied tests were carried out on 35 subjects, chiefly laboratory rabbits and rats but including patch tests on two humans. In view of the essentially negative findings for the greater number of the procedures carried out it seems undesirable to furnish extensive detail material in tabular form. Instead, the results obtained are briefly recorded as follows:

(A) Patch tests of unabraded and abraded skins of rabbits with metallic gallium, gallium nitrate crystals, varied dilutions of gallium nitrate solutions, all led to wholly negative results except in the case of abraded skin when gallium nitrate as such, and its solution as dilute as 2 mg./ml., aggravated the inflammation incident to the abrading procedure.

In the case of the two humans, no positive reactions occurred in varied tests limited to the unbroken skin.

(B) In rabbits (wt. averaging 3.06 kg.) single intravenous injections of buffered gallium nitrate (pH 4-7) up to and including 16 mg./kg. produced no gross evidence of injury. The same amount introduced subcutaneously likewise was without effect.

(C) In adult white rats (averaging 343 grams in weight) a low amount, such as 6 mg./kg. introduced by single subcutaneous injections led to no deviation from the appearance during life and at the autopsy of their controls. When however, this amount was increased to 72 mg./kg. of weight all animals after a delayed period from seven to 14 days presented at autopsy large, hemorrhagic kidneys with presumptive evidence of acute nephritis. At the same time some of these rats presented lesions suggestive of hemorrhagic pneumonitis but without pneumonia.

No tissues were examined microscopically and all opinions therefore are based only upon observation of gross specimens.

Comment

THE occurrence of elements in the same group of the periodic table provides no certainty that physiologic properties will be the same or similar. This is particularly true if the elements are widely separated in the group. Thus silicon and lead appear in group IV although their injurious properties obviously are dissimilar. No less, there is some justification for appraising the physiologic properties of gallium as falling between those of indium and aluminum.

With regard to the dosage of gallium nitrate for intravenous and subcutaneous injection it may be noted that the 50 mg. amount of gallium introduced into rabbits (approximating 3 kg. in weight) is the equivalent of 17 grains for a human weighing 150 lbs. Since gallium *per se* represents some 27% of the gallium nitrate the quantity of this metal under such circumstances approximates 4.6 grains. In the case of the introduction of 50 mg. subcutaneously into rats (averaging 343 gm. in weight) an equivalent amount in grains for a human weighing 150 lbs. approximates 152 for the gallium nitrate, or 41 grains of gallium as such.

Summary

AN EXPLORATORY investigation of gallium and gallium nitrate embraced 65 tests on 35 subjects, chiefly rabbits and rats but including patch testing on the skin of two humans. Results from all patch tests were singularly without significance from metallic gallium, crystals of gallium nitrate and various concentrations of buffered gallium nitrate solutions except in the case of abraded skin. Under those circumstances greater inflammation was induced by gallium preparation than occurred in controls similarly abraded. Intravenous injections of buffered gallium nitrate with a maximum at the level of 16 mg./kg. of weight were without any gross evidence of injury. In the case of subcutaneous injections of like amount certainly no evidence of injury appeared. When the amount was raised to 72 mg./kg., and chiefly in rats, a hemorrhagic nephritis occurred together with some

suggestive indication of pulmonary impairment characterized by hemorrhage. These lesions appeared to arise only after a latent period of from seven to 14 days. In view of the comparatively massive amounts necessary to produce the dysfunction described following single injections, some reason exists for associating with this metal a low order of toxic properties.

References

1. McCORD, C. P., MEEK, S. F., and HARROLD, G. C.: The Physiologic Properties of Indium and Its Compounds. *J. Ind. Hyg. & Tox.*, 24 (Nov.) 1942.
2. LEVADITI, C., BARDET, J., TCHAKIRIAN, A., and VAISMAN, A.: The Therapeutic Properties of Gallium in Experimental Syphilis and Trypanosomiasis. *Compt. rend.*, 192:1142, 1931.
3. MELLOR, J. W.: A Comprehensive Treatise on Inorganic and Theoretical Chemistry. Vol. V. Longmans, Green & Company, Ltd., New York and London, 1929.
4. McCORD, C. P., MEEK, S. F., and NEAL, T. A.: Phenyl Mercuric Oleate. *J. Ind. Hyg. & Tox.*, 23:466 (Dec.) 1941.

A Health Program

—In Terms of Results—

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IN OUR company, an extensive medical service is available to all of our 29,000 weekly paid employees who desire to use it. Those classified as monthly employees because of their higher salary range—approximately 2,200 employees—are permitted to receive only first aid treatment through the medical department. Medical service is not given to the families of employees, but if they wish to join the Associated Hospital Plan, in which their families can be included for hospital services, the company cooperates with them by arranging for payroll deductions which permit them to pay their dues on an installment basis; and the Employees' Mutual Aid Society acts as a go-between in collecting dues and remitting them to the Plan.

Mutual Aid Society

A LARGE part of the cost of our medical services is paid for by the Employees' Mutual Aid Society.

The Mutual Aid Society derives its income partly from the employees, partly from the company, and in a very small part from the stocks and bonds in which the sick benefit reserve fund of $4 a member is invested. The employee's contribution is based on the salary he receives from the company. He pays one cent for each $1.80 he receives, or 0.0055 of his income. For example, an employee earning $15 a week would pay $ .08 in dues; an employee earning $36 a week would pay $ .20 a week in dues. The company's contribution to the income of the Mutual Aid is exactly equal to that of the employees; whatever is collected from the employees is matched by the company.

The Mutual Aid Society also pays cash sick benefits to its members. In long illnesses, after the company sick allowance of one week's sick pay for each year of service is paid, the Mutual Aid Society then pays approximately 80% of the employee's regular weekly salary for a period not to exceed 26 weeks for one continuous absence or for a chronic condition.

Medical Staff

OUR Medical Staff consists of 147 regular employees on a payroll or retainer basis. These consist of 64 physicians, 46 dentists, 10 nurses, seven pharmacists, 18 clerical assistants, and two miscellaneous employees.

In addition to these, approximately 175 physicians attached to various hospitals treat the employees and receive payment for their services. The entire service is directed without "lay" control, and is under the authority of a medical director and his assistants—all physicians in good standing. We also have a dental consultant, a dentist who has been doing work for our employees for the past 25 years.

Medical Bureaus

AT EIGHT medical bureaus strategically located according to the employee working population in the four largest boroughs of New York City, employees receive the following services:

1. Physical examinations before employment or transfer, and special physical examinations.
2. First aid for injuries or illness on the job.
3. Treatment for illness.
4. Diagnosis and treatments from specialists. We have eye, ear, nose and throat, skin, and tuberculosis specialists, and internists.
5. Physiotherapy service under the direction of a physician.
6. Treatment for industrial accidents, if they make a written request for such treatment, and if the physician they select has been approved for the panel by the Industrial Commission.

During 1941 the following treatments were given to employees: 112,580 non-industrial medical and surgical treatments; 13,553 industrial accident treatments; 3,041 complete examinations for employment, transfer, or jobs which require periodic examinations; or on request.

The treatments given include the following specialized types: 10,907 eyes; 4,846 skin; 4,805 ear, nose, and throat; 9,500 physiotherapy.

District Doctors

DISTRICT doctors have been appointed to give medical service to employees who live within the territory served by our companies, with approximately one physician for each district with an employee population of 1,000. An employee who is sick may receive treatment from the doctor in his district, either at home or at the doctor's office, but he is in no way under obligation to use the services of our district doctor if he prefers his own physician. The company does not send a doctor except at the request of the employee or a member of his family.

When a district doctor is requested, he calls at the employee's house and treats him there as long as necessary; then, when the patient is ambulatory, he can continue treatments at the physician's private office. If hospitalization is necessary, the district doctor may refer the patient to one of the hospitals with which we have arrangements; he may request a consultation with one of our consultants or specialists; or he may refer the patient to one of our specialists for further diagnosis or continuation of treatment.

In 1941 the following medical treatments were given to employees through the district medical service: 22,000 treatments at employees' homes; 31,000 treatments at physicians' offices.

Dentists

WITHIN the city, 46 private dentists do work in their own offices for company employees, spending from six to 24 hours a week on this work. They give the following services:

1. Emergency treatment between the hours of 9:00 A.M. and 5:00 P.M.

Text of the Lecture prepared by DR. WITTMER and read by DR. RUSSELL C. KIMBALL, Assistant Medical Director, Consolidated Edison Company, at the Post-Graduate Course in Industrial Medicine at Long Island College of Medicine, November 6, 1942.

2. Extractions (with the exception of impacted molars).
3. Silver, porcelain, cement, or alloy fillings.
4. Restorative work when a complete plate is necessary or when four or more molars are missing, necessitating a partial plate.

Gold fillings, inlays, bridge work, and root canal work are not furnished.

An employee may visit the dentist whose office location is most convenient for him, or he may make a specific choice among the dentists on our staff. The amount of work done and the actual doing of it are left entirely in the hands of the dentist, but his work and his office are periodically inspected by the dental consultant and one of the assistant medical directors. During 1941, 56,000 dental treatments were given.

Specialists

IN ADDITION to the specialists in the Medical Bureau, employees may receive treatments from certain specialists in their own offices. These include three genito-urinary specialists, two rectal and varicose vein specialists, one internist, two surgical consultants, two eye specialists, an allergy specialist, and three ear, nose and throat specialists.

Hospitalization

ARRANGEMENTS have been made with 10 hospitals in the four larger boroughs of the city to accept members of the Mutual Aid Society as ward patients. In addition, under a somewhat modified plan, employees may be admitted to four other hospitals on whose staff are some of our specialists. Employees are transferred to the hospital by private ambulances.

The following financial arrangements are made with the hospitals: For general ward care, $4 a day; use of operating room, $5; ordinary laboratory work, $5; x-rays, the usual ward charges.

We do not pay for special services such as transfusions, x-ray treatments, and special nurses; and it is not our practice to hospitalize patients having tuberculosis, mental disorders or contagious diseases.

Doctors' fees for hospital cases are as follows:

Operation (common) and after care, $50.

Non-operative and medical cases, $2.00 a visit with a maximum of $20 a week and a minimum of $15 a week for any one patient.

Tonsillectomy, including hospital and doctor's fees, $25.

If the operation or treatment is of an unusual type or the after-treatment is unduly long, additional fees are allowed through mutual agreement.

During 1941, 1,052 employees were hospitalized for a total of 13,897 days.

An employee who is under the care of his personal physician or of one of our staff and who requires hospitalization but does not wish to enter any of the hospitals which accept Mutual Aid patients, may go into any hospital approved by the American College of Surgeons. He is not reimbursed for the physician's fee but he receives the amount of his hospital expenses up to $4 a day. Employees who are members of both the Mutual Aid Society and the Associated Hospitalization Plan may elect whichever plan they choose, but both may not be used jointly. If the employee chooses the Associated Hospitalization Plan and the period of hospitalization extends beyond the period allowed by the plan, he is reimbursed for his expenses after the 21-day period up to a maximum of $4 a day. In hospitalization, as well as in other medical services, the fee paid for an employee who has had an industrial accident is that specified in the minimum medical fee schedule for medical treatment and care of injured employees established by the Industrial Commissioner of New York State.

Diagnostic Services

WE HAVE arrangements with various laboratories and roentgenologists to allow our employees to receive diagnostic services. Our physicians are thus enabled to have full use of facilities which can aid them to make proper diagnosis without the usual hesitancy found in private practice because of the desire not to subject the patient to too great an expense. An employee whose physician is not one of our staff may have x-rays or laboratory work done by bringing us a letter from his doctor. We emphasize the fact that we are very glad to be of assistance to an employee's private physician.

Pharmacists

PHARMACIES are located in five of our eight medical bureaus. All the pharmacy employees are registered pharmacists. These pharmacists fill prescriptions submitted by our staff physician, private physicians, district doctors, or specialists. Our physicians are furnished with a written formulary which includes a list of drugs available and which can be compounded from the National Formulary or the United States Pharmacopeia. No patent medicines are stocked or furnished nor is any medicine or drug stocked or used which has not been approved by the American Medical Association.

During 1942, 152,390 prescriptions were filled in our pharmacies.

Convalescent Home

A CONVALESCENT home for employees is maintained in the country at a distance of about 65 miles from New York City. The home accommodates 85 patients, who are under the supervision of a resident physician and registered nurse. All of the fowl, milk, butter, eggs, and cream, and most of the fruit and vegetables and meat, come from the 275-acre farm operated in connection with the home—one of the most modern model farms in New York State.

In 1941, 894 employees spent 18,264 days at the farm.

Health Education

THE chief means of health education is through personal talks with employees as the occasion demands. The medical director also uses the employees' periodical to give advice, in a familiar and colloquial style, on the common principles of ordinary hygiene and the bases of good health.

Miscellaneous Services

THE medical department also gives a few general services:

1. It establishes the conditions to be maintained in the numerous plants and buildings for hygiene, and makes periodic inspections of all company premises.
2. It keeps a personal confidential medical record for each employee. This record begins with the employee's pre-employment examination and records the physical findings, diagnosis, and reports of every medical contact he has while employed.
3. Through the statistics and reports which it maintains, the medical department is enabled to progress in its practice of preventive medicine and in the inauguration of safety provisions.

4. The medical staff cooperates with medical societies and industrial organizations, which profit by the analysis and study of employee illnesses and health experiences.

"Miss Victory"

EARLY in December DR. MAX BURNELL, Medical Director, AC Spark Plug Division, General Motors Corporation, Flint, Michigan, sent us the accompanying photograph of BARBARA ANN CLARK, who, in a contest sponsored by the Hearst Publications, had been selected queen of the 100,000 women war workers in the Detroit area, winning the title "Miss Victory of Michigan." The qualifications that won her this distinction and title were: Regular and conscientious work; precautionary measures in reduction of scrap; fine safety attitude; cooperation with fellow employees; ability to handle and teach many jobs in her own department; 20% participation in bond buying; use of maintenance money from her husband in the service to buy bonds; sharing of rides, and taking pay for rides in stamps; assistance in recruiting 21 Marines; abhorrence of hoarding; canning of fruits without asking for additional sugar; Red Cross work; blood donor; saving fats. In addition, MRS. CLARK (her husband is a radio technician in the Navy) hasn't bought any new clothes for herself since Pearl Harbor and writes regularly to service men, her friends, and her husband.

Some days later, on December 7, in the Chicago Stadium in the presence of a throng of notables and nearly 20,000 parents and wives of fighting men, MRS. CLARK was chosen "Miss Victory—Typical American Girl War Worker" of the nation. In the story of her selection from among the 11 regional "Miss Victories," Ann Marsters, in *Chicago Herald American*, December 8, says as follows: "All her qualifications fit neatly into the picture of what America's 'Miss Victory' should be. She is young and efficient and gracious. She operates a milling machine which helps turn out machine guns at the AC Spark Plug Division of General Motors in Flint, Michigan." Significantly, this photograph shows MRS. CLARK at her machine.

America's "Miss Victory"

Pneumoconiosis among Mica and Pegmatite Workers

—A Supplementary Study—

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THIS brief study summarizes, but in only a limited way, attempts to analyze the physical and x-ray examinations of the 1121 men recently examined for the mica industry in western North Carolina. The examinations began on July 28 and ended on September 15. The men were enlisted and appointments made for their examinations by Mr. Marshall F. Mills, of the Victor Mica Company, and later by the U. S. Employment Service, which was transferred to Spruce Pine largely through the efforts of Mr. Mills and his organization. They were accepted in order by our examining unit which was set up at a central location. The men were recruited from the immediate locality, and almost without exception are native stock—born and reared in the community. They are all members of the white race—hardy, rugged, hard working, honest, country folk. They enjoy many of the necessities of life, but are handicapped with but a few of its luxuries.

For all practical purposes, the dust conditions and working environment that existed during the time these men were building up their mining and mineral grinding experience were identical with those so well explained in detail in U. S. Public Health Service Bulletin No. 250.[1] Time does not permit us to repeat that detailed report here, but reference should be made to this excellent work. It should suffice to state that the dust counts in most instances are well above permissible limits. This is particularly true in the grinding plants and underground mines where the counts may run as high as one billion particles per cubic foot of air. We are happy to relate that some progress is being made to correct this deplorable condition. Dust collection systems are being installed in several of the grinding plants, and wet drilling in the mines is on the increase. However, there is much ground to cover before working conditions in general are what they should be. The Labor Department, the Industrial Commission, and the State Board of Health are all cooperating and making an earnest endeavor to improve the working environment. Both management and labor deserve much credit for their understanding and cooperation. Until recently, depressed business conditions and a lack of complete understanding have somewhat delayed the program. Here we would like to emphasize the importance of an educational program which would precede, or at least go hand in hand with, other efforts to correct faulty practices and improve the working environment. We are both pleased and encouraged by a recent invitation extended to our nurse to come into the high schools in the mining area of the state and show films and talk to the student body on tuberculosis, dust control, and the improvement of working

TABLE 1 — CONTROL GROUP
WITH NO MINING EXPERIENCE

Age Group	No.	Aver. Age	Aver. B.P.	Admit.TBC. Exposure	Healed P. Focus	Inactive TBC.	Active TBC.	Accepted For Emp.	Rejected	Pos. Was.
Teens	58	18.0	125/71.5	0	2	0	0	57	1—pneumonia	0
20-29	61	25.3	129/80.7	5	2	0	0	61	0	0
30-39	35	34.0	134/81.9	7	2	1	0	35	0	0
40-49	30	44.3	139.8/88	4	2	1	0	30	0	1
50-59	23	54.0	138.4/88.4	6	1	1	0	22	1—Potts Dis.	1
60-69	13	63.1	168/100	4	0	0	0	13	0	0
70+	2	72.5	154/85	0	0	0	0	2	0	0
Totals	222	33.0	133.7/81.4	26	9	3	0	220		2 (9/10%)

conditions. We interpret this to indicate an open mind and a desire for facts. If this interpretation is correct, and we believe it is, we are convinced that it indicates progress and that eventually corrective measures will follow and improvement result.

Mica is a strategic war mineral. Airplanes have proved their usefulness beyond question in winning this war. An average of 20 pounds of mica goes into the construction of each plane. Mica, we are told, has no equal in the construction of airplane spark plugs. Previously we imported mica from India and from South America. These imports are now cut off. We must produce our own mica. Even before our imports were stopped, North Carolina produced about 60% of our supply. We must now produce even more. To do so, we must have additional men. These men must be examined.[2] This state of affairs resulted in the examination of the above group of men.

In the second group (Table 2)—labeled "Mixed" because of the fact that their mining experience has included a mixture of minerals, including some of the pegmatite family as well as copper, iron, and asbestos mining, but no mica as such—we find their average age to be four and one-half years more than that in the Control group. Their average mining experience is about eight and one-third years. This group produced five cases of apparently inactive tuberculosis, two cases of active tuberculosis, 11 border-line or granular stage and 13 definite cases of dust pathology, totaling 5.4% of dust pathology. Four men showed a positive Wassermann for a percentage of 0.9%. It will be noted that the percentage of dust disease rose rather gradually between the ages of 30 and 70 years.

In the third group (Table 3)—labeled "Mica" because more than half of their exposure was in mica and because all men with *any* mica exposure were

TABLE 2 — MIXED GROUP
WITH ONE MONTH OR MORE MINING
NONE OF WHICH HAS BEEN IN MICA

Age Group	No.	Aver. Age	Aver. B. P.	Total Yrs. Mine	Aver. Yrs. Mine	Total Yrs. Mica Mine	Aver. Yrs. Mica Mine	Intact. TBC.	Act. TBC.	Border-line Pneumo.	Pneumo.	% Dust Path.	No. Pos. Was.
Teens	19	18.7	126.6/75.8	11	.58	....	....	0	0	0	0	0	0
20-29	102	24.9	127.7/79.7	393	3.80	....	....	0	0	1	0	1.0	1
30-39	128	34.4	129.9/82.3	1098	8.57	....	....	1	0	2	5	5.4	2
40-49	132	43.9	133.7/84.4	1415	10.70	....	....	1	1	5	5	7.2	1
50-59	43	53.3	140/89.1	520	12.90	....	....	1	1	1	3	9.3	0
60-69	16	64.0	156/89.9	211	13.20	....	....	2	0	2	0	12.5	0
70+	3	71.0	146/93.3	25	8.33	....	....	0	0	0	0	.0	0
Totals	443	37.5	132.4/83	3673	8.29	....	....	5	2	11	13	5.4	4

For our purpose, they arrange themselves into three sub groups. The first of these is composed of 222 men who have had no mining or mineral grinding experience, and are hereinafter referred to as the "Control" group (Table 1). The second group is made up of 443 men who have had mining or mineral grinding experience of one month or more, none of which has been in mica. They have spent their time in feldspar, iron, copper, asbestos, kaloin, etc. We shall refer to them as the "Mixed" group. The third group is made up of 456 men, and are now referred to as the "Mica" group.

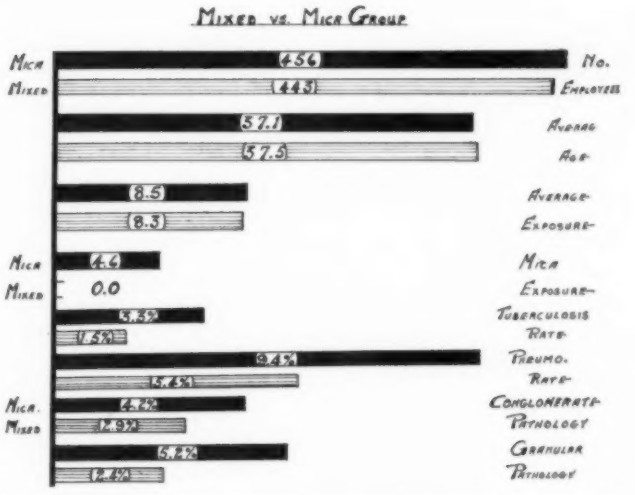
The Control group is an average group of men with ages varying between 18 and 74 years, with an average age of 33 years. All but two were accepted for dusty work.[2] One was refused because of a lobular pneumonia and a temperature of 101° F. The other had an old Pott's disease with marked deformity. No active tuberculosis was found, while three showed apparently healed tuberculosis. Two men had a positive Wassermann—a rate of 0.9%. Generally speaking, they present findings one would expect in any relatively normal group of men of like circumstances.

placed in this group—we find that the number of men is almost the same as in the Mixed group. Their average age is almost the same—37.5 years in the Mixed and 37.1 years in the Mica group, a difference of 0.4 years, in favor of the Mica group. Their average mining experience is almost the same—eight and one-third years in the Mixed group and eight and one-half years in the Mica group. In the Mica group, 54% of their exposure is mica, while the remaining 46% was essentially the same as that of the Mixed group; that is, feldspar, kaolin, copper, iron, coal, asbestos mining, etc. In other words, the only difference of importance is that in the Mica group 54% of their average mining exposure has been mica, while NONE of that of the Mixed group has been in mica. It is true that some of their mica experience has been in mica grinding. Here the dust counts are usually quite high, often ranging as high as a billion or more particles of dust per cubic foot of air. But the grinding is a "clean" process, in so far as free silica is concerned. "Clean" mica is a silicate, theoretically containing no free silica, and it has been claimed

TABLE 3 — MICA GROUP
WITH ONE MONTH OR MORE IN MICA MINING

Age Group	No.	Aver. Age	Aver. B.P.	Total Yrs. Mine	Aver. Yrs. Mine	Total Yrs. Mica Mine	Aver. Yrs. Mica Mine	Inact. TBC.	Active TBC.	Border-line Pneumo.	Pneumo.	% Pathol.	No. Pos. Was.
Teens	30	18.5	123/76	32	1.07	30	1.0	0	1	0	0	.0	0
20-29	129	24.8	131/78.2	525	4.05	340	2.6	0	1	0	0	.0	0
30-39	113	34.6	129.8/82.1	895	7.90	396	3.5	2	1	3	3	5.3	2
40-49	94	44.4	137.8/86.8	1040	11.00	531	5.6	3	3	7	5	12.7	1
50-59	63	53.3	134.6/86.5	951	15.00	534	8.5	2	0	9	8	27.0	0
60-69	23	62.9	138.3/87.7	302	13.10	160	7.0	1	1	5	2	30.4	0
70+	4	71.3	181.2/102.5	126	31.50	86	21.4	0	0	0	1	25.0	0
Totals	456	37.1	132.6/82.8	3871	8.50	2077	4.6	8	7	24	19	9.4	3

TABLE 4

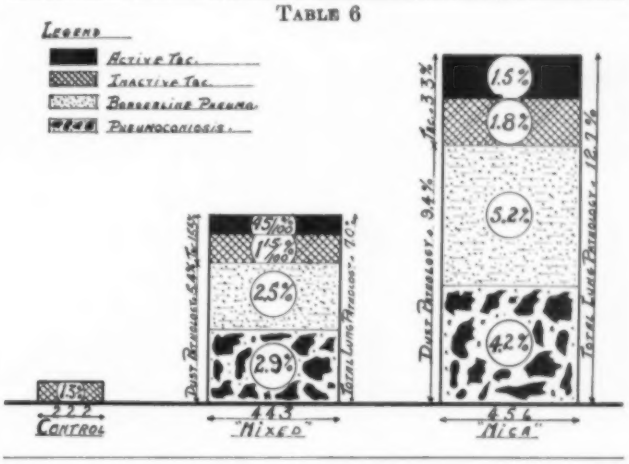


by authoritative sources that asbestos is the only silicate producing lung pathology.[3, 4, 5, 6] Granting this claim would materially reduce the average harmful exposure of the Mica group. But let's look at the record. In this Mica group we find 15 cases of tuberculosis, seven of which are active. This is a tuberculosis incidence rate of 3.3% of the men in the group. In the Mixed group, it is 1.55%, or less than half the rate in the Mica group. In the Mica group there are 24 border line and 19 full grown cases of dust pathology, totaling 43 cases, or 9.4% of all men in the group. In the Mixed group the rate is 5.4%, or only about 57% of that in the Mica group. There were three positive Wassermanns for a percentage of 0.6%. The mica exposed workers show a substantial increase in both dust pathology and tuberculosis.

Lanza[4] calls attention to the literature bearing on this possibility. He also points out that certain laboratory experiments[7] disclose unusual cellular reactions in animals injected with fibrous sericite, and that no other silicate has acted similarly. It will also be recalled that at the International Labor Conference in 1934, "it had been accepted that silicosis might also be due to silicates and, in particular, to sericite."[8]

The above findings were sufficient (Table 4) to arouse our curiosity to the point that we thought it wise to search our files for the records of those men whose entire experience had been obtained in so-called "clean" mica. This search (Table 5) revealed an additional 79 men. In this group, referred to as the "Clean Mica" group, are included no cases with mica mining experience. If the occupational history can be relied upon, these men have been employed in mica grinding plants only, and the group is made up of millers, bolters, and baggers (Table 6). We purposely discarded the mica miners because of the possibility of their being exposed to siliceous dusts in getting out the mica. We felt that this was quite likely because of the fact

TABLE 6

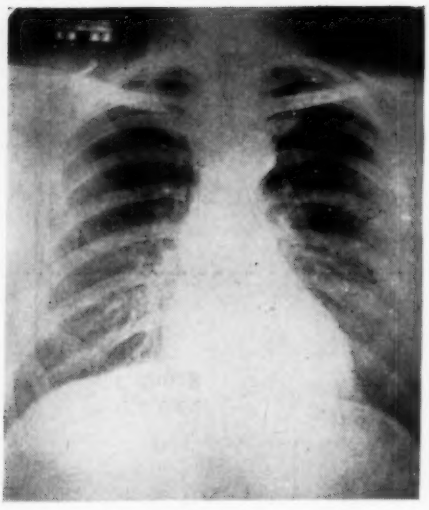


that mica so often occurs along with materials containing free silica. By limiting the group to millers, bolters, and baggers—all of whom are employed in the grinding plants and handle only materials from which the siliceous material has been separated, leaving only the so-called clean silicate—we have attempted to eliminate the possibility of any exposure of a siliceous nature. Reference to the tabulation of these men reveals the average age ranges from 26.9 years to 52 years. We also observe that the greater number, 30, had less than one year of exposure, while six had an exposure of 25 to 30 years. The remainder had exposures falling in between these two extremes, with an average total exposure of only 5.4 years. We find two border-line, and seven full grown cases of pneumoconiosis, for a total of 11.4% of dust pathology. It will be noted that the percentage of dust pathology here exceeds that in the next highest group, the Mica group, by 2%. It is admitted that this group is entirely too small for us to conclude that clean mica is more hazardous from the standpoint of dust pathology than are the other members of the pegmatite family. We do feel, however, that we can safely state that we are accumulating evidence which would tend to show that so-called clean mica is capable of producing lung pathology in man. In making this statement, we are not unmindful of the fact that efforts to produce pathology in the laboratory animal by means of mica dust have so far been unsuccessful,[4] and we feel that a vast amount of additional work lies ahead before the final chapter can be written in the story.

SUMMARY: (1) Mica has become a strategic war mineral and North Carolina is called upon to provide a substantial part of it. (2) Eleven hundred twenty-one additional men were examined and x-rayed in order to provide manpower for its production. (3) The examinations of these men are summarized. The incidence of tuberculosis increased among those with mining and mineral grinding experience, and is even further increased among those whose experience

TABLE 5 — CLEAN MICA GROUP
NO EXPOSURE TO FREE SILICA

Mica Exposure	No.	Aver. Age	Aver. Exposure	Healed P.F.	Borderline Pneumo.	Pneumo.	% Dust Path.
1-11 mo.	30	26.9	0.24	2	0	0	0
1-4 yrs.	22	29.8	2.55	0	0	0	0
5-9	12	35.7	6.40	0	0	1++	8.3
10-14	5	34.0	11.6	1	1	1+	20.0
15-19	1	32.0	17.0	0	1	0	100.0
20-24	3	48.7	21.3	0	0	1+	33.3
25-30	6	52.0	25.5	0	0	1+ 3++	66.6
Totals	79	31.9	5.4	3	2	7	11.4



Represents Early Pneumoconiosis

Represents Moderately Advanced Pneumoconiosis

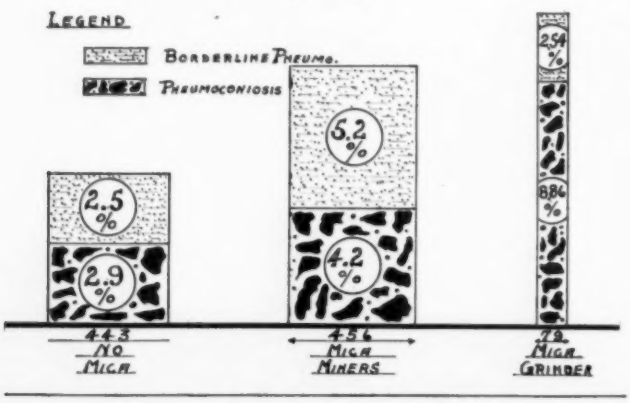
Represents Far Advanced Pneumoconiosis

has included appreciable amounts of mica. Five and four-tenths per cent of dust pathology was found in the Mixed group, while the group whose experience included mica revealed dust pathology of 9.4%, or almost double that in the comparable group with no mica exposure. (4) The total number of men examined is too small to prove conclusively that mica—a silicate—is responsible *per se* for the increase of chest pathology, but we have earnestly endeavored to present the true facts in the hope that these facts may paint their own picture and that additional material will be forthcoming which will complete the picture and perhaps eventually frame it. (5) An additional group of 79 men is presented. These men have had no exposure except to clean mica. By clean mica, we mean mica containing no free silica. Yet these men show a dust pathology of 11.4%. This pathology, from the x-ray standpoint, (Table 7) is not unlike that frequently seen among other mica workers and previously classified as pneumoconiosis or sometimes referred to as silicatosis in contradistinction to silicosis.

Bibliography

1. DREESSEN, W. C., DALLAVALLE, J. M., EDWARDS, THOMAS I., SAYERS, R. R., EASOM, H. F., M.D., TRICE, M. F.: Pneumoconiosis among Mica and Pegmatite Workers, *U. S. Public Health Service Bulletin No. 250.*
2. North Carolina Workmen's Compensation Act, Sec. 50½, Par. (i).
3. Fourth Saranac Laboratory Symposium on Silicosis, "Pathological Anatomy," and "Reaction to Inert Dusts." GARDNER, LEROY U., M.D., pages 37, 143, 144, 145.
4. LANZA, A. J.: Silicosis and Asbestosis, pages 271, 292.
5. GARDNER, LEROY U.: Tuberculosis in Industry, "Respiratory Irritants," page 117.
6. Silicosis: Proceedings of the International Conference, Geneva, 1938, page 61.
7. LANZA, A. J.: Silicosis and Asbestos, pages 275, 276.
8. Silicosis: Proceedings of the International Conference, Geneva, 1938, page 60.
9. PORRO, F. W., and HOBBS, A. A., JR.: Pneumoconiosis in the Talc Industry." *Am. J. Roentgenol. & Rad. Therap.*, 47:4, April, 1942.

TABLE 7



Keep War Workers Well

—Abstracts of Proceedings of the Seventh Annual Meeting of the Industrial Hygiene Foundation of America, Inc., Pittsburgh, November 10-11, 1942—

Reported by

C. O. SAPPINGTON, M.D., Dr. P.H.

MORE than 500 representatives from some 200 industrial concerns and a number of governmental agencies attended the Foundation's annual meeting which was held November 10 and 11, and had for its theme "Keep War Workers Well."

Program highlights included a keynote address on Manpower Conservation by Chairman PAUL V. MCNUTT of the War Manpower Commission, and a panel on Fatigue in Wartime Industry, embracing hours of work and rotation of shifts, under the chairmanship of DR. C. D. SELBY, of General Motors Corporation.

A section was devoted to More Manpower Through Reduction of Absences, at which DR. R. R. SAYERS, Director, U. S. Bureau of Mines, presided. Subjects covered included the common cold, the role of psychology and psychiatry in absences, and a progress report on a study to reduce sick absences which is being conducted by a number of the Foundation's member companies in collaboration with the U. S. Public Health Service.

DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric, directed a panel on Putting Women, Older Men and the Physically Handicapped to Work.

The meeting concluded with a discussion of a Practical Nutrition Program for Industry, by DR. ROBERT S. GOODHART, Office of Defense Health and Welfare Services, and the consideration of a basic plan for industrial deferments, by RUSSELL J. GREENLY, Acting Chief of Personnel, Carnegie-Illinois Steel Corporation.

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Manpower

ANDREW FLETCHER, Vice-President, and JOHN F. MCMAHON, Managing Director, made introductory remarks concerning "The Foundation in Wartime," MR. FLETCHER commenting particularly on the resignation of DR. MELLER and the appointment of MR. MCMAHON with the fortunate arrangement that DR. MELLER'S advice will still be available. The Foundation now has a representative membership and retains its association with the Mellon Institute. It is believed that a membership in the Foundation is an excellent investment at any time, but particularly during the war effort. This is the first war conference of the Foundation and is, therefore, an important occasion. For the past year the Foundation showed a gain in membership and also in financial standing. Research continues to go on at Saranac Lake, University of Pennsylvania, and Harvard University. The Foundation has continued to issue medical and engineering bulletins and educational reports, as well as a monthly digest.

MR. PAUL V. MCNUTT, speaking on the subject "Manpower Conservation," chose as the text of his address the question asked by Stuart Chase in his new book "Goals for America,"—"what is the shape of total war?" The question was answered by Mr. Chase: "It is a condition where every man, woman and child has specific duties to perform on behalf of his country." Our hope of survival, therefore, should be anchored in human lives and human effort rather than in materials and machines.

This concept is particularly needed because of the dazzling changes that occur so rapidly; for example, the time for making an anti-aircraft gun has been cut by four months; welding and the use of light metals have revolutionized shipbuilding and aircraft construction; new plastics and raw materials are being daily put to new uses. It is thus easily seen that we have the physical resources, but we must keep people on the job. We must now consider factors inside and outside industrial plants which affect health and efficiency of workers. We cannot afford to lose a single day of work, nor to discard the services of a single man or woman who can be considered a potential worker. The totals of armaments to be produced in 1943 may be measured in terms of 16 million tons of shipping; 125,000 planes; 75,000 tanks.

The job represents not a national problem, but a group of local problems in individual towns and individual plants. We must find 50,000 additional workers in the next 12 months from sources heretofore not considered. We shall need over five and a half million in the armed forces, and about 18 million men and women will be in war production jobs. There will be fewer unemployed, fewer in agriculture, fewer to man essential non-war services and industries.

There will be a considerable increase in women workers —nearly 15 million women are already at work, the remaining 35 million being the nation's principal remaining labor reserve, of which not more than 13 million will be available to industry. Given adequate supervision and treatment, women should be able to be as well placed as men.

We must also count on the youth and the handicapped. We must forget our ideas about the handicapped and the aged—manpower is the first consideration. There are seven million handicapped persons at present, most of whom could go to work tomorrow.

Fatigue is one of the most effective saboteurs in the war effort—the military services regard fatigue as a major hazard to successful combat. A tired worker on the production line is a danger to himself and to his fellow workers. In this connection eight Federal agencies have jointly subscribed to the policy that for continuous efficient production the eight-hour day and the 48-hour week is the best basic schedule for war work. This agreement is in line with the statement issued by the Surgeon-General of the U. S. Public Health Service some months ago, in which it was pointed out that industries operating on a 24-hour basis would now take steps to minimize the effects of fatigue, night work and the rotating shifts.

There are remarkably few employers who see the relationship between their production "headaches" and conditions both in and outside the plant which directly affect the workers' health and welfare. Apparently there has been gross negligence of simple principles. This remains true in spite of the fact that we have come far in the control of occupational hazards. Pressure, lack of decent housing and transportation, medieval sanitation, improper maintenance and repair of machines and safety equipment are apparently forgotten in the call for more speed. Every community, therefore, must look about for more ways to use every available resource for health protection; more ingenuity and better health on the home front are needed.

A division of medical assets also presents a problem. Recruitment will continue in certain states, although most have met their quotas. Rationing of medical services may be needed. How the needs are to met is the constant concern of the authorities and many plans are tried in different areas; the same plan will not work everywhere.

There must be more pooling of resources to meet civilian needs—for example, more nurses' aides and more non-professional industrial hygienists may have to be used.

In industry, most industrial medical departments are concerned only with compensable injuries. This unrestricted concept of manpower conservation does not justify exempting such industrial physicians from induction into

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THE Foundation in Wartime—ANDREW FLETCHER, Vice-President, St. Joseph Lead Company; Chairman, Foundation Board of Trustees; and JOHN F. MCMAHON, Managing Director.

Manpower Conservation (Keynote Address)—HON. PAUL V. MCNUTT, Chairman, War Manpower Commission.

Fatigue in Wartime Industry (Hours of Work, Rotation of Shifts)—Panel Discussion: DR. C. D. SELBY, Medical Consultant, General Motors Corporation, Presiding.

DR. W. A. SAWYER, Medical Director, Eastman Kodak Company.

PROF. NATHANIEL KLEITMAN, University of Chicago.

DR. WILLIAM H. FORBES, Harvard Fatigue Laboratory.

MEDICAL Committee Report—LIEUT.-COL. A. J. LANZA, M.C., Chief, Occupational Hygiene Branch, U. S. Army.

Inhalation of Magnesium Dust—DR. L. U. GARDNER, Director, The Saranac Laboratory.

Further Studies of Aluminum Powder in Combating Silicosis—DR. J. L. BLAISDELL, Queen Alexandra Sanitorium, London, Ontario.

Health Hazards in Use of Artificial Abrasive Grinding Wheels—DR. W. IRVING CLARK, The Norton Company.

Practical X-Ray Techniques for Mass Physical Examinations—DR. E. P. PENDERGRASS, University of Pennsylvania.

How to Prevent Dermatitis in War Industries—DR. LOUIS SCHWARTZ, U. S. Public Health Service.

PREVENTIVE Engineering Committee Report—PROF. PHILIP DRINKER, Harvard School of Public Health.

New Methods in Exhaust Ventilation—MAJ. T. F. HATCH, S.C., Fort Knox, Kentucky.

Keeping Score on Toxic Materials and Processes in the Plant—E. C. BARNES, Westinghouse Electric & Manufacturing Company.

What the Foundation's Plant Surveys are Showing—DR. F. R. HOLDEN, Industrial Hygiene Foundation.

Health Problems in Suddenly Expanded Industrial Communities—DR. HUNTINGTON WILLIAMS, Commissioner of Health, Baltimore.

Legal Committee Report—T. C. WATERS, Mullikin, Stockbridge & Waters, Baltimore.

INDUSTRIAL Health Program of the Organized Medical Profession—DR. STANLEY J. SEEGER, Chairman, Council on Industrial Health, A.M.A.

Disability in Silicotics—DR. GEORGE W. WRIGHT, Edward L. Trudeau Foundation.

More Manpower Through Reduction of Absences—DR. R. R. SAYERS, Director, U. S. Bureau of Mines, Presiding:

Findings from Foundation-Public Health Service Study—DR. W. M. GAFAFER, U. S. Public Health Service.

Some Common Causes of Sick Absences and Their Prevention—DR. J. J. WITTMER, Consolidated Edison Company.

The Cold as an Industrial Health Problem—DR. SIMON S. LEOPOLD, University of Pennsylvania.

Role of Psychology in Absences—W. H. KUCHNICK, Director, Civilian Personnel Training, U. S. War Department.

Role of Psychiatry in Absences—LIEUT. MEYER BROWN, M.C., U. S. Navy.

The Accident Factor in Absenteeism—NED H. DEARBORN, Executive Vice-President, National Safety Council.

PUTTING Women, Older Men and Physically Handicapped To Work—(Panel Discussion): DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric, Presiding:

E. P. CHESTER, State Supervisor, Vocational Rehabilitation, Connecticut.

MISS MARY ANDERSON, Director, Women's Bureau, U. S. Department of Labor.

DR. J. M. CARLISLE, Medical Director, Merck & Co.

DR. E. R. A. MEREWETHER, H.M. Medical Inspector of Factories of Great Britain.

A Practical Nutritional Program for Industry—DR. ROBERT S. GOODHART, Office of Defense Health and Welfare Services, Federal Security Agency, Washington, D. C.

A Basic Plan for Industrial Deferments—DR. RUSSELL J. GREENLY, Acting Chief of Personnel and Chief of Training and Education, Carnegie-Illinois Steel Corporation.

the armed forces. Industrial medical departments should draw upon local physicians wherever possible and, in any circumstances, the medical care at the plant should include the treatment of non-compensable illness on the job. Preventive services should be provided.

In war production areas where there are not enough doctors, and industrial physicians and nurses are available, home care should be given both to workers and their families.

The problem is one of total conservation of manpower which involves both prevention and restoration. Finally, it may be essential to render the same service for industry as is provided for the armed forces, in order to conserve manpower for winning the war.

Fatigue

DR. C. D. SELBY presided during the panel discussion on "Fatigue in Wartime Industry," introducing the speakers and outlining the panel procedure.

In talking on this subject, DR. W. H. FORBES stated that it is a serious and common error to think of fatigue as a single entity. It is, on the contrary, a general term covering very different conditions which arise from different causes and require different treatment. For purposes of discussion we should distinguish between three main types: physical fatigue, mental fatigue and nervous fatigue.

Physical fatigue is due to continued and hard muscular exercise. When pronounced, it is always recognizable, and in a rough way measurable, by the increased ventilation of the lungs and heart rate and the various well-known changes in the blood (increase of lactic acid, etc.) which are found immediately after violent exertion. It is of great importance in troops and formerly was important in industry—probably still is in China and other heavily populated but non-industrialized areas. It is not of any importance in the modern industries of this country where for 10 cents enough electrical energy can be purchased to do the foot pounds of work which a strong man can barely do in a week.

Mental fatigue is a condition arising after long-continued mental work which does not involve any emotional strain. It is of very minor importance in industry.

Nervous fatigue is the type which occurs whenever there is great pressure on a person to get as much done as possible in a given time, or whenever there is much emotional strain accompanying the work. It is of enormous importance in industry, in fact, it is this kind of fatigue that almost everyone refers to when, at the end of a day, he says "I am tired." It is hard to decide which of the three main causes of nervous fatigue—pressure to work at full capacity, emotional strain, or numerous imperative and distracting stimuli—is the most important.

Slight degrees of this condition are normal, harmless and unavoidable at the end of a day's work. Marked degrees, however, are very undesirable, leading to discontent, accidents, illness, and inefficiency. The most important single step which can be taken to minimize this type of fatigue is the very difficult one of developing and fostering a spirit of spontaneous cooperation and friendship within a group of workers and harmonious relationships with the foremen and management. Next in importance and even more difficult is the provision of an emotionally satisfactory life outside of the factory. Supervision can play no part in this—it will defeat the object.

We have assumed that the pay and working hours are satisfactory. The experience of the English has shown that in most industries it is probably unwise to allow men to work over 55 hours a week as a regular thing. Sundays off and occasional longer holidays are essential. Women do not differ markedly from men in their ability to stand long hours, but it must be remembered that many of them must do a considerable amount of housework, cooking, or marketing in addition to their work in a factory.

In short there is only one type of fatigue which is of paramount importance in industry. It cannot be wholly avoided, but it can be minimized by anything which will get the men working together contentedly as an informal and spontaneous team.

With respect to working shifts, the following outline was suggested for three eight-hour shifts by Prof. Nathaniel Kleitman:

Red (Sunset) shift. Working hours from noon to 8:00 P.M. Evening and early night free for leisure activities. Sleep from 1:00 or 2:00 to 9:00 or 10:00 A.M.

White (Victory) shift. Working hours from 8:00 P.M. to 4:00 A.M. Sleep from about 5:00 A.M. to 1:00 P.M. Afternoon and early evening free for leisure.

Blue (Dawn) shift. Working hours from 4:00 A.M. to noon. Leisure in the afternoon. Sleep from about 7:00 P.M. to 3:00 A.M.

This shift timing has a number of advantages. One of the distinct advantages is the relatively small displacement of the customary sleeping hours, as no one is compelled to sleep in the afternoon hours, when it is hardest to sleep. Another advantage is that it also makes shift changing fall at hours which are not general community rush hours.

The Red Shift will appeal to young unmarried men and women who like to have their recreation late in the evening as it enables them to stay up to or beyond midnight and sleep later in the morning.

The White Shift will appeal to middle-aged individuals whose social life has altered. As their children have all grown up they need not be disturbed while sleeping during the forenoon hours. They would have the afternoon free as they would not be due to begin work until 8:00 P.M.

The Blue Shift fits in very well with the schedules of families of the intermediate age groups, where there are small children. The father could go to bed early in the evening at the children's retiring time. He would return from work shortly after noon, and have the afternoon free.

In special situations it may be necessary to institute four six-hour shifts, each worker putting in seven days per week, or a total of 42 hours. After 20 weeks of work one would thus have put in 840 hours, which is the same number that he would put in during 21 weeks at 40 hours per week. He would then have earned and receive a week's vacation, and if rotation of shifts is adopted the change can be made after the week's vacation. By having 20/21 of the whole force working, 1/21 can be off on successive weeks.

With the four-shift arrangement, the distribution could be as follows:

A. The Red shift: working hours 3:00 P.M. to 9:00 P.M. Sleeping hours as in the Red eight-hour shift.

B. The White shift: working hours 9:00 P.M. to 3:00 A.M. Sleeping hours as in the White eight-hour shift.

C. The Blue shift: working hours 3:00 A.M. to 9:00 A.M. Sleeping hours a little earlier than in the blue eight-hour shift.

D. The Gold (Sunshine) shift: working hours 9:00 A.M. to 3:00 P.M. Sleeping hours, as usual, at night.

Some industries may find it impossible to run their machinery continuously and may have to adopt two 10-hour shifts. These shifts could be distributed as follows:

A. The early shift from 4:00 or 5:00 A.M. to 2:00 or 3:00 P.M.

B. The late shift from 2:00 or 3:00 P.M. to midnight or 1:00 A.M.

By this arrangement no one would be expected to work during the early morning hours of greatest inefficiency. The shifts could be "steady" or of infrequent rotation.

The scientific solution of the multiple-shift problem is not bound up with the number of shifts and the duration of each. The important elements are a minimum displacement of the normal cycle of activity and a sufficient time on the odd schedule of hours to enable the individual to adjust himself by not only developing, but also keeping the newly established cycle.

Form of Appeal to the Workers:

A. Rotate shifts once in several months, if at all.

B. Abolish the "graveyard" shift by 4 A.M., noon, and 8 P.M. shift changes.

C. While on a certain shift, sleep during the same hours every day, including your days off. Select a schedule of meals corresponding to your working hours and maintain it at all times.

D. Induce your family to adjust their activities to your schedule. Create "neighborhoods of time"—associate with

others on your time routine. Develop community activities, club meetings, tournaments, lectures, and movies to coincide with your new leisure hours.

E. Above all, observe regularity in your daily routine of work, meals, leisure and sleep. Remember that a SLEEPY WAR WORKER IS INEFFICIENT AND LIKELY TO HARM HIMSELF AND HIS MACHINE, BUT IS A BIG HELP TO THE ENEMY.

LIEUT. COL. A. J. LANZA, Chairman of the Medical Committee of the Foundation, omitted his formal report because of lack of time. This report will be published later in the Proceedings of the Foundation.

Magnesium Dust

DR. L. U. GARDNER, in discussing the subject "Inhalation of Magnesium Dust," stated that recent interest in wounds caused by splinters of magnesium raised the question of a possible dust hazard from the inhalation of this metal. Although this seemed improbable because of the methods of processing it, experiments have been undertaken to demonstrate whether finely divided magnesium can act on the lungs in the same manner that it does in the subcutaneous tissue. These experiments have shown that a quantity of such mineral particles capable of causing a "gas tumor" beneath the skin produces only a transitory acute inflammation in the lungs. The early reaction then heals, leaving little or no permanent effects. The reasons for the innocuous effects in the lungs are largely anatomical. Here the irritant is introduced directly into large air spaces which communicate freely with the exterior by bronchi and the trachea. The particles are ingested by phagocytes that are either loosely attached to the inner surface of an air space or wander freely over its lining membrane. Attacked by water in these cells the minute magnesium particles are dissolved. The products of such reaction injure only single unattached cells and any undestroyed metal is again picked up by new phagocytes. Not enough of the mineral is transported into the fixed tissues of the pulmonary framework to cause appreciable injury. Since the effects of one large dose of particles are relatively innocuous it seems highly improbable that the quantities of magnesium that could reach the lungs by inhalation would have any significant effect.

Lantern slides of pathological specimens of the skin and lungs of experimental animals were shown, illustrating the above-mentioned changes.

Aluminum Powder

DR. J. L. BLAISDELL spoke on the subject "Further Studies of Aluminum Powder in the Treatment of Silicosis."

This investigation, which has now been in progress for a period of three years, is based upon the experimental work of Denny, Robson and Irwin, who showed that the development of silicosis in animals could be prevented by the inhalation of small quantities of metallic aluminum powder. Following the publication of their observations in 1939, the treatment of human cases of silicosis was proposed in the hope that aluminum powder might act as a therapeutic agent in already established cases of this disease. A clinic was established at Timmins, Ontario, where a large number of silicotic subjects could be observed.

In the selection of cases to be treated, only men who were still exposed to silica dust and were still employed in the mines were considered, and only those with uncomplicated silicosis with measurable pulmonary disability were chosen. Before treatment was instituted, each individual was carefully studied clinically and radiographically, and a large number of respiratory function tests were carried out. The latter included a study of total lung volume and pulmonary ratios, as described by McCann and his co-workers. Pulmonary ventilation studies were also made, employing standard exercise tests on a calibrated bicycle ergometer.

Selected cases were treated by the daily inhalation of fine metallic aluminum powder, freshly ground from small aluminum pellets in a specially-constructed mill. A number of these dust mills were employed at various mines and treatment was usually given just before or following a shift. Treatment, administered daily, was begun by five minutes inhalation through the dust mill. This period was gradually increased to 30 minutes daily, and was continued over periods in some cases of almost a year, a small number of men receiving approximately 300 treatments, the majority, however, receiving about 200. About 50 patients have received this form of therapy, 34 of whom have now satisfactorily completed the course prescribed.

This investigation has shown conclusively that the administration of aluminum powder in the manner described is entirely harmless and has proved definitely beneficial in a number of cases under observation. Out of 34 cases studied, 19, or 56%, have shown clinical improvement, apparent chiefly in the lessening or disappearance of shortness of breath, cough, pain in the chest, fatigue. A reduction in the incidence of colds and a gain in weight have also been observed in many of the cases. While 14 cases have remained stationary, it must be emphasized that they are no worse and their condition has not progressed, in spite of continuous employment in silica dust during the period of investigation. Respiratory function tests, repeated at intervals of about every three months, have shown improvement in 13, or about one-third, of the treated cases. While 22 remained stationary, they are no worse in spite of continued exposure to silica dust. A group of controls, untreated by aluminum, have shown progression of their disease in 65% of cases while under observation.

Aluminum dust cannot be regarded in any sense as a "cure" for silicosis in so far as restoring to normal, lung tissue which has already undergone fibrotic change. Its use, however, would appear to be followed by beneficial results in a significant proportion of cases, chiefly in the amelioration of symptoms and in the increased capacity to work. In view of these findings and the experimental work of Robson, Denny, and Irwin, it is believed the inhalation of finely particulate metallic aluminum dust will prevent the development of human silicosis.

This presentation was accompanied by a lantern slide demonstration showing photographs of the different kinds of apparatus used and tabular statistics of the results of the investigation.

Mass X-Rays

DR. E. P. PENDERGRASS presented the subject "Practical X-Ray Techniques for Mass Physical Examinations." During the past few years roentgenographic surveys of the chest of large groups of individuals has become an important new addition to the practice of medicine and public health. Under the stimulus of the war this method has been so extensively employed, both by the military services and industry, that it has already acquired refinements and established a reputation for reliability, which in ordinary times might have taken many years to attain.

From the experience of the military services in several million pre-enlistment and pre-induction roentgenographic examinations of the chest, the following facts may be stated:

1. At least 75% of early active tuberculosis can be discovered only by x-ray examinations.
2. About 1% of the male population of military age in the United States has active tuberculosis, and most of the cases can be detected only by x-ray examination.
3. A high proportion of cases of early tuberculosis detectable only by x-ray examination are likely to break down under such strain as that entailed by military duty, incapacitating them for further service and making them a menace through contagion to their comrades.
4. Roentgen examination of the chest is much quicker than the ordinary methods of physical examination, as well as being more reliable.
5. Roentgen examination furnishes an authoritative and permanent record which may be indispensable in future medicolegal adjustment.
6. Many other diseases in addition to tuberculosis may be discovered in mass surveys.
7. The procedure will amply repay the initial cost, by the saving of effective military manpower and the reduction of the ultimate cost to the Federal government in pensions.

These principles are just as applicable to industry as to

the military services, for in these days when the maximum in human effort is needed the industrial worker must be healthy and protected from the ill health of the man by his side. Furthermore, industrial management must be kept from bearing the burden of future liability through ignorance of the state of a worker's health at the time of employment. It is a fact that selective service boards are turning down men with heart and lung lesions who may ultimately apply to various industries for jobs. It is likely, in the present manpower scarcity, that a great many individuals with chest lesions will find employment. And it is a foregone conclusion that the nature of this employment in many instances may tend to fan the coals of a pre-existing disease that may in time incapacitate not only the new employee but also lead to an unnecessary and hazardous exposure of the previously-healthy older and more experienced worker at his side.

Dermatitis

DR. LOUIS SCHWARTZ, discussing "How to Prevent Dermatitis in War Industries," mentioned the various types of protection common to many different kinds of cases, such as protective clothing, gloves, protective ointments, and adequate washing facilities, including soaps, which are non-irritating.

Cutting oils are the chief causes of dermatitis in the manufacture of motors, tanks, shell casings, projectiles, and airplanes wherever cutting and turning of metals is performed. The oils are divided into two large groups, the soluble and the insoluble. The soluble cutting oils rarely cause dermatitis, despite the fact that they are usually teeming with bacteria. The insoluble oils are usually sterile, yet they are the principal causes of cutting oil boils, and dermatitis. The metal slivers in them may wound the skin; the sulphur, chlorine, and inhibitors they contain may irritate the skin; the petroleum oil itself may plug the pores, causing comedones which may form boils if infected by bacteria from dirty clothing or unwashed skin.

Solvents produce dermatitis by defatting the skin. They may also cause allergic dermatitis. "Dopes" used on fabric parts of airplanes can cause dry, chapped hands or acute eczematoid vesicular dermatitis of other portions of the body. Paint thinners, petroleum solvents such as kerosene, and varsol, act in a similar manner. The fumes of the solvent chlorinated by hydrocarbons used in degreasing tanks sometimes cause severe allergic eczematoid dermatitis.

Electroplating is primarily a rust preventive process. Chromium and cadmium are the principal materials used, but silver, zinc, copper, and nickel are also frequently employed. In addition, there are a number of rust preventing processes, "parkerizing, chromadizing, anodizing, etc." In all these processes the tanks contain strong alkaline or acid fluids which give off irritant fumes. Ulcers of the nasal septum, resulting in nose bleeds and even perforation, are common. Dermatitis is frequent from mist and fumes coming off the alkaline, chromic acid, dichromate, and cyanide solutions in the plating tanks. Dermatitis also occurs among those who clean the metals with strong acids and alkalis prior to electroplating, and among those who handle the wet metal from the plating tanks.

Welders and solderers are exposed to irritating fumes. Welding of stainless steel and aluminum alloys requires fluoride fluxes which evolve fluoride and hydrofluoric acid fumes. If not properly removed by suction vents, fumes may irritate the nasal mucosa or skin. The nostrils and skin should be protected with non-carbolated vaseline or lanolin. The skin must also be protected.

Trinitromethylnitramine, commonly called tetryl, will sensitize and cause dermatitis in from 10 to 15% of all new workers, one to two weeks after they begin handling it, although in a few cases it may require several months for sensitivity to become manifest. Workers coming in contact with the dust from dry grains of tetryl and from tetryl pellets are more frequently affected than those handling wet tetryl. Those exposed to the dust may first develop nose bleed or bloody discharge from the nose. The nasal mucous membrane becomes turgid and small superficial erosions may sometimes be seen. Distinct ulceration of the mucosa has not been observed. On those exposed to dry tetryl, the dermatitis usually begins on the face. The naso-labial folds and the skin under the lower eyelids are first affected. There may be sufficient edema to close the eyes. The skin may be blistered and have the appearance of a second-degree sunburn.

In a workroom where there is TNT dust, the newcomer experiences a bitter taste. Trinitrotoluene causes sensitization dermatitis in a smaller percentage of new workers than does tetryl. The dermatitis usually begins in from seven to 14 days after work with TNT is begun. It usually attacks the hands, wrists, and forearms, but the points of friction, the collar line, belt line, and ankle are also often affected. It is unusual to find TNT dermatitis on the face, but the genitals and the submammary area are sometimes affected from soiled fingers. A generalized eruption may also occur in rare cases. The lesions on the palms are characteristic in appearance. They are deep-seated sagolike vesicles and are accompanied by considerable edema and discomfort. As the dermatitis subsides, the skin on the palms peels in large thick pieces with new skin beneath. The lesions on other parts are not as characteristic as those on the palms, consisting simply of papules, vesicles, and crusts, followed by flaky desquamation. TNT also stains the skin and discolors the hair but not as much as tetryl. Cyanosis, or blue lip, is fairly frequent among workers exposed to TNT while it is rare from tetryl.

Fulminate of mercury is used in detonators and primers. Most of the dermatitis from fulminate occurs in making detonators, especially in hot weather. In making primers, the fulminate is used in wet form, but it dries on the clothes and skin and will cause dermatitis even on the covered parts, as it seeps through the clothes. The dermatitis is allergic in character and occurs chiefly on the face, neck, and arms. Inhaling the dust may cause nasal mucitis: an erythematous weeping crusted dermatitis in the peri-nasal area is not uncommon. Conjunctivitis and dermatitis of the eyelids also occur. The other ingredients of the primer mix, such as antimony sulfide, may be added causes of the dermatitis.

DNT or dinitrotoluene also causes sensitization dermatitis but not in as high a percentage as TNT. There is no characteristic appearance to the dermatitis caused by DNT. It is the usual eczematoid dermatitis, erythema, papules, vesicles. The sites are usually the wrists, collar line, belt line, forearms and hands.

Ammonium nitrate can cause dermatitis, but even in a smaller percentage of workers than does DNT.

Lead azide, which, like mercury fulminate, is used in detonators and primers, is manufactured from sodium azide reaction with lead nitrate or acetate. Fumes given off from this reaction produce headache if inhaled. Unlike mercury fulminate, lead azide rarely produces dermatitis in those exposed to it in the manufacture of detonators, primers, etc. One patient has been observed with dermatitis who handled a primer mixture containing both lead azide and mercury fulminate. Patch tests with both explosives were positive. Since dermatitis occurs so rarely from exposure to lead azide, special measures for protection of the skin are not indicated.

A considerable proportion of skin troubles may be avoided by the proper selection of workers. Thus individuals with a known hypersensitive skin as shown by neurodermatitis, allergic manifestations, or history of atopy or infantile eczemas should not be employed in skin hazardous occupations. Neither should those with dry skins be employed at jobs where they must wet the hands in solvents. Nor should cases of marked acne be subjected to contact with cutting oils. Negroes are usually more resistant to many skin irritants than are whites.

PROF. PHILIP DRINKER, Chairman of the Committee on Preventive Engineering, on Tuesday afternoon gave the report of that committee in summary. The committee has issued one bulletin by Prof. Hatch on an engineering subject and a later one by Hemeon; expects to continue its work, and will welcome suggestions, but no elaborate research program has been planned on account of present

conditions. The full report will be found in the Foundation Proceedings.

Exhaust Ventilation

MAJOR T. F. HATCH, S. C., gave a progress report on the Foundation-supported study on the subject "New Methods in Exhaust Ventilation."

1. OBJECTIVE of study: The objective of this study was to develop, so far as possible, a fundamental basis for determining the design requirements of exhaust systems which would serve in place of the empirical procedures now commonly employed.

2. FACTUAL basis for a fundamental method of hood design:

(a) All atmospheric contaminants released by industrial processes are dispersed into the plant atmosphere by air movement only. If there were no air motion past the offending process there would be no distribution of the contaminant beyond the immediate zone of release.

(b) The function of an exhaust hood, therefore, is not to capture the contaminant but to collect the air into which the contaminant is dispersed.

(c) The rate of air flow into an exhaust hood, as a consequence, must equal or exceed the rate of flow of air past the process.

(d) The extent to which the hood ventilating rate must exceed the rate of air movement depends upon the hood efficiency, that is, upon the amount of clean air which must be exhausted in order to capture all of the contaminated air.

3. MEASUREMENT of rate of air displacement as a basis for hood design:

(a) Since it is the air movement away from the zone of contaminant release which the exhaust hood must prevent, it is clear that one should know the rate at which air is flowing through the area in order to determine the minimum rate of exhaust ventilation required.

(b) The primary recommendation resulting from this investigation, therefore, is that, preliminary to the design of an air exhaust system, the rates of air displacement existing at the various processes be measured.

(c) Rates thus obtained will serve, with suitable factors of safety, to determine the air flow capacity of the exhaust system.

(d) This procedure contemplates the direct study of the actual processes to be controlled and does not depend upon assumed similarity with other processes and experience with them.

(e) The proposed method does not have universal application, since it requires that the pattern of air flow past the process be rather clearly defined. It also requires a certain degree of enclosure of the process. Its application is believed to be wide, however, and experience with it in the design of a large-scale system has demonstrated its practical value.

4. METHOD of measuring rate of air displacement:

(a) Air motion around an industrial process may result from a number of causes which may be divided, according to source, into two classes, external and internal. Examples of the former are normal room convection currents, action of nearby belts, flywheels, movement of reciprocating parts. Internal sources include those which are inherent in the process and others which are only incidental. Inherent sources include the strong convection currents set up by hot bodies (such as a casting, steam bath, welding operations), by the expansion and contraction of a stream of falling rock as it leaves a belt and falls into a bin, the fan action of a grinding wheel or of a hammer mill, etc.

(b) The air flow established by such sources is not confined to a definite path and cannot, therefore, be measured by the usual methods of metering. In the present study use was made of the well-known technic of measuring the dilution of a suitable test substance, in this case a test gas introduced into the air stream. The method has been described and its errors and limitations discussed in a recent Foundation bulletin. In its present form it is relatively simple to use but has the serious disadvantage of not yielding instantaneous concentrations, which must be known in many cases where the rate of air displacement is not continuous but rises periodically from zero or a low level to a maximum value and then back again, (example: barrel filling). In place of the chemical method of analysis for the determination of the test gas concentration, a direct-reading meter should be used. No such instrument is now available for carbon dioxide. In certain studies toluene has been employed as the test gas since it can be measured instantaneously in a direct-reading photometer. For obvious reasons, solvent vapors could not be employed in industrial plants. Recent developments in the use of infra-red photometry for measuring carbon dioxide are promising. Another possibility is to employ a test gas containing a radioactive substance, the concentration of which could be simply measured. These and other suggestions should be investigated further, since the basic idea of determining ventilation requirements from measurement of the rate of air displacement appears to have considerable practical value.

5. SUGGESTED steps in hood design:

(a) Study the process with a view to determining the source or sources of air motion established during its operation.

(b) If a source is external and independent of the process take every practical means to eliminate it. For example, a flywheel or other rotating part may be shielded; convection currents rising from a hot tank can be minimized by insulating the side walls; leaking parts in a compressed-air operated machine should be repaired.

(c) Even a source of air movement which is inherent in a process may be reduced in strength. For example, the amount of air displaced by falling rock increases with the height of fall. By substituting a stone ladder for an uninterrupted chute the total drop is broken into several steps which together will produce less air displacement.

(d) In the case of semi-enclosed processes, determine the points of entrance of the air as well as the escape openings. In many cases the opportunity for air to get in can be greatly reduced, thus minimizing the rate of displacement. For example, the airflow resulting from the strong fan-action of a hammer-mill can be reduced by carefully restricting the inlet.

(e) After identifying the sources of air displacement and eliminating or minimizing all that are subject to control, the next step is to study the pattern of air flow. For this purpose a visual smoke generator may be employed.

(f) Next, construct a temporary enclosure (if one is necessary) of a pattern that will confine the flow in the manner desired.

(g) Using the temporary enclosure, measure the rate of air flow by the dilution technic.

(h) From the rate of air displacement thus determined and the knowledge of air flow pattern obtained by smoke tests an estimate may be made of the factor of safety to be employed. Thus, the rate of ventilation is determined.

6. THE TIME required to make the tests outlined above is not great and it is believed that the information thus obtained will result, in many instances, in improved design and performance of exhaust systems.

7. APPLICATION to the study of general ventilation:

(a) For the control of a number of industrial operations general room ventilation is employed. The rate of ventilation should be determined so as to dilute the contaminant down to a safe level. By means of the dilution technic the ventilation characteristics of the room may be evaluated and a quantitative basis for improving the system of general ventilation obtained. The steps are as follows:

(1) Feed the test gas at a constant rate into the zone of release of the contaminant.

(2) Determine the equilibrium concentrations of the test gas at the various working locations and in the air as finally discharged from the room.

(3) Under conditions of complete mixing the concentrations thus obtained would be alike. If, at any sampling point, the concentration is higher than at the final outlet, one knows that the rate of effective ventilation in this area is less than for the room as a whole and in reverse proportions to the concentration found.

(4) From such a survey it will be possible to improve

the system so as to effect more uniform ventilation and, perhaps, without any actual increase in the total ventilation.

(5) If, in addition to the equilibrium concentrations, the rates of build-up of the test gas concentrations and the rate of decay after the gas feed is shut off are obtained, one can predict the cycle of concentrations of the contaminant which will obtain at the various points of exposure for a given cyclical release of the contaminant. The mathematical relationships will be considered in another report.

(Grateful acknowledgement is made to the Industrial Hygiene Foundation and to the American Air Filter Company for their financial assistance which made this study possible. It is regretted that, because of the war, the work had to stop while still in the preliminary stage. A full report will be made of the work and especially of the application of the proposed technic in the design of a large exhaust system. It is to be hoped that the method will receive further field tests and that a simpler and more flexible test procedure will be developed.)

Toxic Materials and Processes

MR. E. C. BARNES spoke on "Keeping Score on Toxic Materials and Processes in the Plant." In this field of investigation there are hundreds of materials to be considered and thousands of people are exposed to them. The principle of the investigation is to provide for an exchange of information between the laboratory and the production staff, using card forms for this purpose, some of which were exhibited by lantern slide demonstration. In past experiences, for some time general statements were used and later on it was possible to give more specific data with reference to the various problems encountered.

The objective of these procedures is to control hazards and to prevent the occurrence of occupational diseases. Lantern slides were shown of examples of how the method works, particularly with varnish, benzol, and toluol, the various card forms being exhibited with the data given in the exchange of information between the laboratory and the production staff. It is thus possible with such a system to know what materials are going to be used, to assay their toxicity, and to prescribe proper measures of protection, including fire protection, safety measures, and personal protection. This, therefore, represents a truly preventive program and it is important that many industries understand the place this occupies in modern industrial hygiene.

Plant Surveys

DR. F. R. HOLDEN outlined "What the Foundation's Plant Surveys are Showing."

Surveys frequently show ventilating systems used improperly. The avoidance of drafts is also an important item. Windows often allow contaminants to return to the room; such contaminants also may return from the outside through other departments. The common mistake in the use of respirators of dust type, for protection against vapors, has been encountered in a number of instances; there is also a lack of proper fitting and maintenance of these devices.

Various examples were given of the solution of different problems, including the use of a polymerized resin in protection against skin irritation.

There is needed a middle ground between frightening a workman to the point where he is of little value, and where he shows a wilful disregard or ignorance of the dangers of his occupation. The continuous systematic program of education and supervision administered by foremen and supervisors, backed by top management, has inexceptively and amply demonstrated its practical worth.

The need for speed in production today is of paramount importance, but it should not be at the expense of forethought in the provision of safeguards for health and safety. Mr. Barnes in his excellent paper on keeping score on toxic materials in the plant has provided a practical, working method for accomplishing that task. All too frequently the first knowledge that the medical or safety department has of a new process, machine or material is when it is in operation, perhaps in an obscure corner of the plant. Forethoughtfulness will prevent dangerous exposure. The cost is higher for placing makeshift safeguards or exhaust equipment on a machine after it is in use. Time is lost and confidence in management is endangered if adequate planning is neglected in supplying proper protective devices.

The Foundation is now engaged in a study of the toxicity of the products of reaction from the manufacture of a new chemical by a member company. During the laboratory stages of the development work on this chemical there were no indications of danger. Ten days after it was placed in pilot plant production two workmen were stricken seriously from exposure to the chemical or one of the by-products. By means of the data obtained from animal studies it will be possible to avoid a recurrence of this tragic experience.

Every new chemical or product should be investigated as to its toxicity before it is prepared in large amounts and released to the public. This practical commonsense procedure is followed by several larger producers of synthetic chemicals. At least two of the companies are members of the Foundation and can furnish details of their experience to other interested members.

Restrictions on strategic materials for our military needs have resulted in the increased severity of some common hazards. The amount of tin present in solders has been reduced, resulting in an increased amount of lead and occasionally the addition of other toxic metals such as cadmium. Exposures to fumes from solder should be reevaluated in the light of these new conditions. There will undoubtedly be cases where protective measures which were adequate for the normal solders will fail to prevent lead or cadmium poisoning.

The survey work of the Foundation was summarized in tabular form, as follows:

Industry	Type of Survey	Hazards	Findings and Recommendations
Chemical manufacturer	Toxicity study	Gases and dust	Hazard determined—long-term study recommended
Chemical manufacturer	Toxicity study	Dust	Study in progress
Coated products manufacturer	Spot survey	Vapors	Hazard under control
Electrical equipment manufacturer	Spot survey	Dust	Hazard under control
Electrical equipment manufacturer	General survey	Dusts, vapors, gases and fumes	Spot surveys recommended
Glass manufacturer	Spot survey	Dermatitis	Hazard controlled by protective creams and protective clothing
Glass manufacturer	Spot survey	Dusts, vapors and gases	Hazards under control except for incorrect use of exhaust equipment
Glass manufacturer	Spot survey	Dust and spray	Check on previously installed equipment; found all right
Heavy chemicals manufacturer	Two weeks atmospheric study	Atmospheric pollution	Extent of hazard determined
Metal container manufacturer	Spot survey	Vapors, gases, and dermatitis	Exhaust ventilation recommended; creams and protective clothing introduced
Steel producer	General survey	Dusts, vapors gases and fumes	Spot surveys recommended
Steel producer	Spot survey	Dust	Exhaust ventilation, use of water to reduce dust; new raw material storage
Steel producer	General survey	Dusts, vapors gases and fumes	Spot surveys suggested
Steel producer	Spot survey	Fumes and gases	Exhaust ventilation recommended
Steel manufacturer	Spot survey	Dust	Exhaust ventilation recommended
Stone products company	Spot survey	Gases and dust	Exhaust ventilation suggested where needed
Stone products company	Spot survey	Dust	Exhaust ventilation urged
Zinc and lead producer	Two months atmospheric study	Atmospheric pollution	Hazard under control

Health Problems

DR. HUNTINGTON WILLIAMS discussed the subject "Health Problems in Suddenly Expanded Industrial Communities."

The theme of this meeting is in keeping with the ideas of public health officers in various communities. We shall not be far wrong in putting housing at the head of the list of necessities, although more maternity hospitals and more available medical, nursing and dental services are needed. Also there should be larger immunization programs for children and more well-baby clinics.

Rural families coming to cities or to war production areas create communicable disease problems. Some of these are presented in proper sewage disposal and adequate water supplies, the sanitation of milk supplies, and the proper management of restaurants and nutritional services in industrial areas.

There were summarized studies in two different plants, called Plant A and Plant B. In Plant A there were from two to eight employees engaged in benzol dipping operations in the manufacture of rubber products, this exposure having previously been considered only an explosion hazard at this plant. Studies and recommendations were made, and it was found that benzol poisoning had occurred. It was recommended that ethyl acetate be substituted for benzol. Meanwhile a new building had been built with adequate exhaust ventilation for these operations.

In Plant B, a group of 4000, there was a radium dial operation involving 10 employees. The management sought information. Cooperation was obtained through the U. S. Public Health Service and studies were made. Instructions for the workers were devised and posted.

The Health Department of Baltimore began in 1922 its work on carbon monoxide studies. In 1932 a Division of Industrial Hygiene was established. The work has continued under adequate supervision since that time.

Much more should be done in industrial hygiene work—affairs in this field are in a highly unsatisfactory state. Especially are there needed liaison officers between employers and industrial hygiene services.

Industrial hygiene occupies a definite place in the public health program, but usually requests for services come from old patrons. Employers apparently continue to ignore their needs.

In summary, a broader application of community health resources is needed in the integration of industrial hygiene.

Laws

MR. T. C. WATERS, Chairman of the Legal Committee, gave the report of that committee. Many states have various laws applicable to the employment of women in industry. The U. S. Department of Labor has summarized state labor laws for women, covering the following classes of laws:

1. PROHIBITORY and regulatory laws:

Twenty-two states and the District of Columbia have no prohibitory or regulatory laws regarding the employment of women. In 17 states women are prohibited from working in mines; Oregon prohibits their employment in messenger service; Connecticut, Massachusetts, Missouri, New York, Vermont and Washington require specified unemployed periods before and after childbirth; Louisiana forbids them cleaning moving machinery; California prohibits the lifting or carrying of heavy weights; Colorado prohibits their employment in the operation of coke ovens; Ohio prohibits their employment as crossing watchmen, molders, workers in blast furnaces, etc.; Pennsylvania prohibits their employment for maintaining fires in hand-fired boiler furnaces, handling nitrators in the manufacture of nitroglycerine, and the operation of cranes, together with forms of welding; New Jersey and Pennsylvania prohibit their employment in the manufacture of nitro and amido compounds and other substances containing lead in excess of 2%; Ohio and Utah prohibit their work in smelters; Arizona, New York, Ohio, Oklahoma and Wisconsin prohibit their work in quarries.

2. NIGHT work laws:

Eleven states, including New York, New Jersey, Pennsylvania, Massachusetts, and California, prohibit the employment of women at night in manufacturing establishments. All of these states now provide for exemption in war manufacturing for women 21 years old and over. In some of these states the night work laws especially provide for exemption, while in others the governor or State Labor Departments have granted exemptions under their general powers.

3. MAXIMUM hour laws:

Five states, Alabama, Florida, Indiana, Iowa, West Virginia, do not limit the length of the work-day or work-week. In 21 states and the District of Columbia, the maximum work-week for employment is 48 hours or less, and all but four of these now permit women to be employed in war production work longer than the established standard, the exemption being provided either in the law, or by permit from the State Labor Department. Twenty-two states establish a maximum work-week of 48 hours, but in some of these permission may be obtained from the State Labor Department to work additional periods of time. However, of this group 14 states prohibit any relaxation of the standard.

4. DAY of rest laws:

Twenty states and the District of Columbia require one day of rest in seven for women employed in manufacturing, but of these New Jersey and North Carolina, and the District of Columbia are the only ones that do not permit relaxation of the required time for women employed in war production.

This year has been an off year for most of the state legislatures, but in some of those that were in session occupational disease compensation laws, or amendments to the existing laws, were introduced.

In Rhode Island, Senate Bill No. 115, providing compensation for silicosis and asbestosis, was enacted, becoming effective October 1, 1942. This bill adopts a schedule of increasing benefits, beginning with the sum of $500, with monthly increases of $50 until the maximum of $3,000 is reached.

In New Jersey, three bills were introduced and are now pending, the session not having been concluded. Assembly Bill No. 235 would have added to the list of scheduled diseases now compensable under the New Jersey laws the following:

> "Dermatitis, including that resulting from and involving the direct use of flour, fruits, preserves and other ingredients used in bakeries."
>
> "Asthma and infection resulting from the inhalation of flour and flour dust, or any ingredients of flour used in bakeries."

This year there was introduced Senate Bill No. 73 to establish a workmen's compensation act for Mississippi, the only state now without such a law. This bill, which included compensation for 32 specified occupational diseases, failed of enactment.

In the following states legislative resolutions have been passed authorizing the appointment of interim commissions to study and recommend legislation for occupational disease compensation at the next session of the legislatures:

Arizona	Minnesota	Ohio
Michigan	Nevada	Wyoming

What is the significance of the proposed amendments to our compensation statutes and the trend of judicial opinion construing those statutes? It is submitted that employers face the imposition upon them of greater legal responsibilities for compensation for injuries to the health of their employees. We have been too legalistic in our interpretation of management's responsibility under compensation laws. The potential industrial development of this country is beyond the conception of any of us here present. To accomplish that development we are entering upon a new phase of industrial relationships. The successful business will and must assume legal responsibility for the care and maintenance of the health of employees and their families. When this war is over you and I are going to live in a better and happier world. This country is not going to be bankrupt—it will never be bankrupt as long as we have our great natural resources and healthy men and women to carry on our industrial enterprises. The health of our people is one of our greatest assets, and the preservation of that asset is one of management's greatest responsibilities.

Employers and insurance carriers must stop thinking solely in terms of workmen's compensation insurance as we now know it. They should start thinking about the insti-

tution and extension of well-considered plans for health insurance. Many of our large corporations today have taken the lead in this matter and have developed programs that will achieve a better relationship between employers and employees. The responsibility is not solely that of management. Labor must bear its part of the cost of that insurance. When progressive plans have been adopted and are carried out, it is submitted that the technical problems involved in the construction of our compensation statutes will be minimized.

Organized Medicine's Program

IN THE absence of DR. STANLEY J. SEEGER, Chairman, A.M.A. Council on Industrial Health, his paper on "The Industrial Health Program of the Organized Medical Profession" was read by DR. RAYMOND HUSSEY, of Baltimore, Wednesday morning.

Every day it becomes clearer that successful prosecution of the war must be accompanied by increased and intensified industrial health activity. I believe it is safe to say that we know enough as physicians, engineers, and others to make nearly every job safe, healthful and more productive. We can all agree that our most immediate concern should be to arrange for as widespread, efficient application of this information already in our possession as we possibly can. Research naturally is a highly essential factor in the prosecution of wartime industrial health, but, in the main, the most pressing medical problems jointly confronting industry and the medical profession under the pressure of current and coming events, are those involved in the provision of more and better preventive medicine and surgery, and much more extensive and improved industrial health conservation by physicians and others in war production plants of all kinds and sizes.

Unfortunately in war time it is not always possible to carry into full effect plans for promoting industrial health because of very severe and growing limitations in available personnel and facilities. If we are to have an army of 7,500,000 men or over, and if for each 1000 of troops we must provide 6.5 doctors, the effect on communities and industrial health services will be almost beyond estimation. Already very acute situations have developed—so acute, indeed, that the procurement and assignment of physicians for essential industrial service is one of the major unsolved personnel problems of today. With these far-reaching complications in mind, we are likely to accomplish more in the direction of improved industrial health if we can satisfactorily solve three major problems:

1. We must try to conserve the few well-trained industrial physicians, hygienists, nurses, and others not alone in their present professional capacity, but as a nucleus for training recruits into these professional groups. Whether or not this attitude will obtain realistic consideration by official agencies, set up to conserve and make proper use of medical and other professional manpower, still remains to be seen.

2. We must convince small and medium-sized plant operators that it is desirable in every way to support programs of industrial health. There are naturally large plants which will need instruction also.

3. We must persuade and educate the employee to take greater interest in his own physicial welfare off the job as well as on it. We must recognize that employees spend more time away from work than on the job, and that, in many instances, conditions of work are actually more favorable to health than co-existing bad housing, poor nutrition, and improper use of leisure time. We are, therefore, in the process now of developing, within the medical profession, means for implementing this program. I must emphasize again that we are confronted at every turn with severe restrictions in what we can hope to accomplish but, in general, our approach has been as follows:

The first element in a successful campaign for improved industrial health service is creation of public demand. Avenues must be developed for acquainting the employer, the worker, and, in fact, the community at large, with the health and economic benefits to be derived from industrial medical service.

The next, and perhaps most essential, element is to arrange for improved education of physicians in industrial health, both before and after graduation. This has been a major plank in the platform of the Council on Industrial Health since its inception.

The third essential element in our program is the establishment of improved committee organization in state and county medical societies for aggressive leadership in all aspects of industrial health service. Such committees already exist in 46 states and the movement is gaining impetus in industrial counties. Our recommendations in respect to specific industrial health activities by committees are as follows:

1. The personnel of the committee should contain representation from private practice, industrial practice, and the established public health services.

2. The committee should understand the components of adequate industrial health service and be prepared to adjust them to existing local medical and public health facilities and to patterns of community medical practice. In this connection, under ideal circumstances, each war production plant regardless of size should have access to:

(a) A physician who takes genuine interest in a properly conducted industrial medical department and who is willing to devote regular time to service inside the plant.

(b) Industrial nurses with proper preparation, acting under the physician's immediate supervision or standing orders, will constitute the principal source of sustained industrial health activities for most small industrial concerns.

(c) Industrial hygiene service directed at improvement of working environment and control of unhealthful exposure provided by physicians and others under the guidance and assistance of the specialized personnel in the state or local bureaus of industrial hygiene.

(d) A plant health program will include:

(1) Good first aid, emergency, and subsequent medical and surgical care for all industrially induced injuries.

(2) Proper health supervision through physical examinations and health education.

(3) Good correlation with family physician and other community health agencies for adequate management of non-occupational sickness and injury.

(4) Good records of all causes of absence from work as a guide to necessary control, and the establishment of proper preventive measures.

3. The committee will be expected to undertake any assignment or local situation which requires the exercise of medical initiative and leadership.

Our recommendations as a Council (A.M.A.) have been committed to the thoughtful consideration of all physicians in civil practice as a means for contributing directly to the war effort, and at the same time capable of adjustment with the existing methods of community practice. What the future holds is beyond our knowledge, but, in any event, we feel that organization of the highest type is urgently needed if the essential interests of worker, employer, and the physician are to be properly understood and intelligently safeguarded.

Silicosis and Breathing Function

DR. GEORGE W. WRIGHT discussed "Correlation of X-Ray Findings with Breathing Function in Silicosis."

It is the purpose of this study to estimate the effect of silicosis on the function of the lung at rest and during physical exercise. The chief purpose of breathing is to maintain a low concentration of carbon dioxide and a high one of oxygen in the air spaces. Pulmonary function can therefore be looked upon primarily as a problem in ventilation. Our methods for estimating the ability of the lung to perform this function include the following factors:

1. Volume of space to be ventilated by each breath.
2. Maximum minute ventilation.
3. Resting lung function (minute volume, respiratory rate, oxygen and carbon dioxide interchange).
4. Chemical composition of lung gas.
5. Effectiveness of the lung for maintaining proper concentration of gases in the blood. (Oxygen and carbon dioxide concentrations in arterial blood.)

Tests of items 3 and 4 inclusive were made at rest, during and at intervals after performing a measured amount

of work upon a treadmill. To date, 69 men have been studied all of whom are regularly employed as miners or surface men. None of them complains of respiratory symptoms. On the basis of x-ray findings they have been classified in three groups:

1. Controls: As nearly all our silicotics were over 40 years of age, the 21 control subjects were selected from the same age groups. Some of these men had had years of exposure to dust without developing silicosis. Seven of them were studied at least twice.

2. The "Pre-silicotic" Group consisted of 21 men showing varying degrees of exaggeration of the normal lung markings by x-ray. In this group, 15 were also over age 40, and the majority had been exposed to dust underground for many years.

3. The Silicotic Group consisted of 27 men with a history of adequate exposure to dust. Of the total number, 14 were classified as minimal and 13 as advanced, but none had conglomerate fibrosis. In four of them, all the tests have been repeated with essentially the same findings.

It is to be emphasized that the subjects in all groups were working every day in the mines and hence they could not be disabled to a significant degree.

Results: The methods used in this study have been shown by duplicate means to have a very small inherent error. The lung volume measurements were not significantly different in silicotic miners and control subjects of the same age group.

The blood of both silicotic and control miners was normal in oxygen and carbon dioxide content.

On the basis of group averages, the responses of silicotic miners to exercise and during recovery, while slightly less favorable, were not strikingly different from those of the controls. Many individual silicotic miners performed as well as the high normal controls.

As a group, the silicotic miners failed to maintain as low an alveolar carbon dioxide and as high an oxygen content as the controls. While this finding strongly suggests that during exercise the silicotic lung is less effectively ventilated, available methods for sampling alveolar air are not entirely satisfactory and free from error, particularly during exercise. The import of this finding must, therefore, be accepted with some reservations at this time. We can report that in 27 random cases of simple silicosis with no conglomerate reaction, lung function is adequate and compares favorably with that in miners in the same age group with no x-ray evidence of dust.

Absenteeism

DR. R. R. SAYERS, Director, U. S. Bureau of Mines, presided at the symposium on "More Manpower Through the Reduction of Absences."

DR. SAYERS gave an interesting resumé of Great Britain's experience in the control of voluntary absenteeism. In this program, better food, better transportation, and adequate education have been used, together with the principle of posting names of absentees with reasons.

It is a very complicated problem to keep men at work, and the answer or solution to the problem is not yet apparent. One of the most important things is to know first what is going on, and that is what this symposium will attempt to show.

DR. W. M. GAFAFER presented the subject "Findings from Foundation-Public Health Service Study."

Lantern slides were used, exhibiting tabular matter on various subjects, as follows:

1. Summary of data from 14 companies reporting to the Industrial Hygiene Foundation during the year 1941.

2. Frequency and percentage distribution of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during year 1941; experience of all male employees in 14 companies reporting to the Industrial Hygiene Foundation.

3. Frequency by broad cause group, of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during 1941; experience of all male employees in 14 companies reporting to the Industrial Hygiene Foundation compared with companies reporting to the U. S. Public Health Service.

4. Frequency by cause, of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during 1941; experience of all male employees in 14 companies reporting to the Industrial Hygiene Foundation compared with 29 companies reporting to the U. S. Public Health Service.

5. Frequency of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during 1941, by broad cause group, according to duration of cases; experience of all male employees in 14 companies reporting to the industrial Hygiene Foundation.

6. Frequency, by company, of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during 1941, according to broad cause group, sex and color; experience of employees in 14 companies reporting to the Industrial Hygiene Foundation.

7. Frequency of cases of sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, eight to 14 days, and 15 days or longer, beginning during 1941; experience of white male employees in 13 companies reporting to the Industrial Hygiene Foundation.

8. Annual number of days of disability per employee, by company, yielded by sickness and non-industrial injuries disabling for eight consecutive calendar days or longer, beginning during 1941, according to sex and color; experience of employees in 14 companies reporting to the Industrial Hygiene Foundation.

The conclusions on these data were: The 50,000 males and 2,200 females yielded, during 1941, a total of 4,000 absences and 230 absences, respectively. Approximately 142,000 days were accounted for by all of these absences of eight-days or longer. If sick absences of one-day or longer had been recorded there would probably have been about 25,000 absences instead of 4,000 among the males, and 1,800 instead of 230 among the females; moreover under these conditions the 142,000 days disabled would probably have been doubled. These are conservative estimates, since the data reported yielded for the reporting companies AS A GROUP relatively low frequency and disability rates.

Notable among the findings are: (1) the relatively high variation of the rates among the different companies; and (2) the favorable experience of the 14 companies taken AS A GROUP when compared with other experiences.

Now that data for one full year are available, further reporting would make it possible to measure the effects, in terms of sick absences, of changed conditions introduced by war activities, and would give valuable information for purposes of sick absenteeism reduction. It is hoped, therefore, that the 14 companies will continue their reporting, and, furthermore, will seriously consider the reporting of an additional set of sick absences, namely, those of less than eight days in duration.

Causes and Prevention

DR. J. J. WITTMER was not able to be present to give his paper on "Some Common Causes of Sick Absences and Their Prevention," but provided the following abstract:

I am particularly glad of this opportunity to discuss this matter with you and to give you, from my experience, an account of some of the methods we are trying in the Consolidated Edison System Companies, and finding successful to some extent. I say successful because the average employee lost 6.3 days and, from the reports one received from national statistics on absenteeism, this figure is approximately 50% of the expected incidence. Even in a company such as ours, one day lost per employee per year is equal to $200,000; and what is more important is the number of man-hours lost. In the case of defense industries where millions of men are employed, one additional day of lost time per year can equal thousands of employees.

PRE-PLACEMENT EXAMINATIONS: A properly conducted pre-placement examination with the idea of fitting the employee into a job for which he is physically, as well as mentally and through experience, equipped, is the first important method of preventing future trouble. Even in these days of wartime pressure upon the examining phy-

sician, a complete examination should be made. Within the last few days an instance came to our attention regarding a former employee of our company who had been placed on our retirement roll for a total and permanent physical disability. An investigator from one of the large aeronautical plants came in to inquire about this man's employment record. This man had already passed a brief medical examination and had been accepted by the examining physician for an armed guard to do night work guarding their properties. The physical condition that this man had was such that it would have been dangerous for him to have worked alone or to have done considerable walking.

CARE FOR THE EMPLOYEE: A well set up medical organization with adequately maintained medical records is essential. Such an organization permits us to:

1. Diagnose and treat minor ailments of the employee who is ambulatory and working.
2. Diagnose, treat and follow up major ailments of the ambulatory or non-ambulatory, non-working employee.
3. It is of primary importance to get sick people off the job early in their illness. Diagnoses made at the beginning of the illness and the institution of prompt treatment prevent more serious conditions arising and thereby eliminate lost time.
4. To keep people off the job until they are well. An adequate period of treatment and convalescence is necessary to prevent recurrences.
5. To check all absences for genuineness.

We have several special methods at our command to further our absenteeism control. We require that when an employee has four or more absences in a year, due to the same medical condition, or when the period of his absence extends beyond four weeks, he should be given a special examination. The cold or grippe cases are referred to our chest clinic, where a fluoroscopy is done and followed up with an x-ray or sputum analysis if desirable. Chronic stomach cases are referred to our diagnostic internist for work up and x-ray and laboratory analysis.

NON-GENUINE ILLNESSES: The primary method for correction of the employee whose illness is not genuine is, of course, to deny him his pay for the time he is out. The majority of these cases are alcoholics. Sometimes a pay denial is not sufficient, and the employee repeats the offense. The situation then calls for further discipline.

Psychological reactions are an additional factor to be considered, and I shall mention only a few of the more obvious maladjustments. Employees are sometimes not adjusted to their jobs, and are unhappy in their work. Sometimes home troubles interfere with an employee's work, consciously or unconsciously.

COOPERATION OF THE EXECUTIVE STAFF: To carry out the suggestions of the medical organization, the backing of the management is needed. We must be in a position sometimes to have proper job adjustments made. During convalescence, part-duty assignments are necessary. The employee's time does not need to be totally lost, and it is often to the benefit of the employee if he is given some work to do.

PERIODIC PHYSICAL EXAMINATIONS: Although the ideal situation is to have periodical physical examinations of all employees at stated intervals, we have found that we are unable to make it mandatory for all employees to have annual physical examinations. However, periodical examinations for some types of employees, such as chauffeurs and those men and women engaged in hazardous occupations, are mandatory.

PREVENTIVE AIDS: Where it is not feasible to maintain a medical organization in outlying buildings or plants, first-aid stations can be maintained, with employees trained by the medical department to handle situations which require first aid.

Preventive drugs or treatments are furnished to employees who need them. Vitamins, for example, are supplied by doctor's prescription, when the need is genuine. Inoculations against disease are not mandatory, but they are made available to employees who desire them.

Rest periods for employees who are on repetitive routine work are valuable in relieving physical and mental fatigue. Rooms for eating or for relaxing in restful surroundings are valuable in breaking nervous tension.

SANITARY CONTROL—PLANT HYGIENE: The health of workers requires absolute cleanliness, the best sanitary facilities and healthful working conditions. All plants must be inspected regularly by or under the supervision of the medical department to insure that conditions are satisfactory.

RIGID ACCIDENT PROGRAM: A program of accident prevention and safety is of extreme importance. It may be supervised by the medical organization or by a staff organization in cooperation with the medical department. A successful accident program includes not only such factors as I have already mentioned, periodic examination of workers, examination of all workers who are below their usual standards, the maintenance of first-aid stations, etc., but a program of safety education which will be effective in teaching both supervisors and employees to anticipate and prevent hazardous conditions or carelessness.

HEALTH EDUCATION: Various methods of education in hygiene may be used, such as articles in house organs, the use of posters, or talks to groups of employees about some special conditions which require care. Probably the most effective health education consists of face-to-face talks with the doctor specifically about the patient's own condition. Advice which comes when it is needed, and which applies to one's self, is of more value than most mass education. The ideal time for this education is during the periodic health examination.

One more point on hygiene—in my opinion, every effort should be made to urge employees who live within a mile and a half of their office to walk to and from work.

The Common Cold

DR. SIMON S. LEOPOLD presented the subject "The Cold as an Industrial Health Problem."

The common cold is the most frequent infectious disease in the United States and it is economically the most wasteful. The causative agent is a specific filtrable virus, and in cases uncomplicated by secondary bacterial invasion the cold is a short, self-limited disease. The frequency of secondary bacterial invasion increases the seriousness of the common cold to such an extent that the physical disability produced by it constitutes a major industrial problem.

The ideal methods of prevention of contagion, isolation of the infected individual, adequate spacing and sufficient natural ventilation regardless of season, are not feasible for industry, particularly in the present emergency. The use of face masks for infected workers is impractical and ineffective.

Prophylactic vaccines, whether administered by mouth or hypodermically, are of no value for those with sufficient natural immunity to resist repeated colds. They are chiefly useful in the prevention of secondary bacterial complications. The wholesale and indiscriminate administration of cold vaccines lacks scientific data in support of their use.

No so-called abortive treatment of a cold shortens the disease. Bed rest may prevent its complications. In the absence of the specific virus, chilling and fatigue do not cause colds, but probably diminish resistance to the infectious agent. Methods of air sterilization, to be as effective as possible, must be based on the knowledge of how bacterial and virus air-borne infections are conveyed.

It would appear, from the studies of Andrewes, that ultra-violet light is very effective against the bacteria and viruses present in sprays from coughing and sneezing, and probably much less so against the organisms in dust. With this reservation it is an almost ideal method of air sterilization, but the cost of installation and maintenance in large factories makes its general use impractical.

Propylene glycol vapor as an aerosol is inexpensive, relatively non-toxic and extremely effective against bacteria, human influenza virus "A," and probably also against the virus of the common cold. More extensive clinical study and practical methods of vaporization on a large scale remain to be devised.

Mechanical ventilation with air filtration diminishes the number of air-borne bacteria and viruses. The ideal method of air sterilization may prove to be the combination of

mechanical air conditioning and air filtration with either ultra-violet light or with one of the effective aerosols such as propylene glycol. The best method will depend upon the size and other physical features of the particular space to be sterilized.

Psychology

MR. W. H. KUSHNICK discussed "Role of Psychology in Absences."

Why does a person absent himself from that activity from which he gains his livelihood? Absenteeism, like any social phenomenon, is but one aspect of the larger problem involving what the worker wants and expects not only from his job but also from his very existence—from his life. The psychologist knows that the person's life must be examined as a complete whole—that any attempt to separate the work situation from what occurs off the job is a false segregation. The worker frequently does not know why he prefers something else to going to work. Even if he did know, the real reason would seldom get into the records. Workers do not care to tell on themselves.

Some people would have us believe that voluntary absence on the part of the worker is a natural human reaction to the routine of modern efficiency. They would lead us to conclude that there is a maladjustment, somehow, between man's instincts and desires and the regular working habits that are imposed upon him. The fact is that some people, some workmen, do enjoy their work. There are some who do not miss time or take off for personal reasons. And there are some who take more time off than others.

Of the contributing factors which are conducive to absenteeism, we shall consider the more important of those as they result from (1) the general work situation, and (2) the prevailing social and economic conditions. From the psychologist's point of view these conditions *per se* are not important. The matter of prime concern is the effect of such conditions upon the life of the individual involved. What is the effect upon the sentiments, attitudes, "feelings" of the individual?

Conditions affecting absenteeism which exist in the general work situation are placement of workers, management policy and attitude, and physical working environment.

It is an accepted fact that proper job placement is fundamental to job satisfaction. Having a person perform that work for which he is best suited by temperament, aptitude, and intelligence is an important part of personnel management. Consider for a moment the worker who is misassigned —who is being asked to perform work for which he is not suited. In his case effective motivation is difficult. He has no interest in the job at hand. He becomes easily bored. Every day is just so many hours to be spent at the same drudgery. Finally, he is apt to become "fed-up" with his work.

Proper placement is not an easy task. Many devices have been constructed to aid in proper placement. Yet in many instances these tools remain too incomplete, too rough, to be used with a great amount of certainty. The problem is further aggravated by the fact that today's labor market is operating on the basis of the collection of workers rather than selection. Today, maximum utilization of manpower seldom can be achieved at the point of initial placement. Of greater importance is the assignment that is made after careful observation of the person on the job.

Management policy and attitude are other factors in the general work situation which are frequently reflected in the absenteeism records. Employees, no matter what type of work they are performing want to feel that somehow they play a part in their management. They want to feel that both collectively and individually they are being recognized by management. They want to know that "top-side" is aware of them and appreciates that they want to contribute with everything they have—their hands, their heads, and their hearts. They aspire toward an industrial democracy.

An important consideration in management policy and attitude is the fact that employees are seeking equal opportunity in line with what is available for others, and equal pay for the performance of like duties. The workers as a whole resent the evidence of favoritism. They want promotions, increases in hourly rates, and other factors directly concerned with their fortunes to be dependent upon their capacities and abilities.

One of the effects of the failure of management to deal properly with the human element is a sense of frustration on the part of the employee. Lack of interest from management cannot but bring a lack of interest from employees. It might be well at this point to set forth the hypothesis that absenteeism, from one point of view, is a manifestation of aggression on the part of the worker. It is, in effect, the employee's way of showing his supervisor that he is more important—that he will be missed more than the supervisor admits in practice.

The physical environment at work is another consideration that should not be neglected. Undesirable working conditions, such as inadequate lighting, heating, or ventilating facilities, or a disorderly and dirty work environment, may affect the way the worker thinks about his job. The overcrowding of washroom facilities after a hard day when the force is washing up to go home can frequently be the "last straw." Given such a send-off, the employee may decide then and there that tomorrow he is not going to come to work—that he will not stand the same condition the next day.

Let us now turn to the factors in the prevailing social and economic conditions to examine this area of influence. These include such factors as a rapid change in life conditions necessitating a change in habits, the lack of recreational opportunities, inadequate or overcrowded housing, the absence of sufficient transportation facilities, and a rapidly expanding industrial organization.

Attention should be given to the fact that in the case of a six- or seven-day work week, industry today is asking of employees something they have been taught not to accept. Modern philosophy in respect to working hours has until very recently been that of a five-day work week. People who have been accustomed to a five-day week—and most of us have until recently been working such a schedule —cannot immediately adjust their habits to six or seven days of continuous work.

Shift rotation represents for workers another disruption of their normal way of life. There is concrete evidence that absences increase in percentage when employees go on a night shift. The heretofore satisfactory patterns of living no longer fit the new life conditions.

Human beings must have a normal social life. If, while working on a night shift, they are unable to find means of social contact and recreation it is understandable that they will miss work now and then. To help the workers on night shifts, several communities and industrial plants have made arrangements for the social participation of such employees during their off hours. Management must foster more of this activity in its efforts to reduce avoidable absences.

Wage incentives may be included under the general economic conditions affecting workers' attendance. At the present, many people are earning more than they have ever earned. If the worker's present income is in excess of his previous standard of living, he is inclined under certain circumstances to prefer the leisure of a frequent holiday to the satisfaction of additional wants which he has not habitually acquired. On the other hand, if he is properly motivated, if he can see the ultimate ends of his efforts, if he feels a direct participation with the group, absenteeism is less apt to result from the above causes.

In large numbers of industries today it has been necessary to hire persons unprepared to perform the tasks required of them. They do not have the proper work habits and are, consequently, apt to be irregular in attendance. Just as in the formation of other habits, employees develop work habits only through actual performance. Before the present crisis the average age of those entering employment for the first time was over 20 years. Now this average age is being lowered as labor is becoming more and more scarce.

We cannot expect the 17 and 18 year olds, now first entering employment, to step immediately from the irresponsibilities of youth to the responsibilities of adulthood with no backsliding. It takes psychological leadership to help youth bridge the gap.

Inadequate or overcrowded housing conditions near the place of employment result in definite problems which the worker must face. In the case of inadequate accommodations it frequently means that a disproportionate amount of time is spent traveling to and from work. It means, in consequence, that even more time is taken from that left by longer working hours. Under such conditions, there is despairingly little time for attending to personal wants and needs.

Overcrowded living conditions prevent the worker from obtaining his necessary rest and relaxation. Human beings find it necessary to have some privacy, some place where they can shut themselves off. Imagine, if you will, the results to a worker whose day has gone all wrong, and who has then to face the social obligations necessitated by crowded living.

The War Department is the nation's largest single employer of civilians. There are more than a million on its payrolls. These civilians work in occupations having the simplest and the most technical requirements. We too have faced and continue to face these problems of adjustment. We have found that the establishment of employee counseling activities has helped considerably. The relationship of the counselor to the employee is like that of a doctor to his patient. The counselor spots grouches, misunderstandings, detrimental influences to work and morale, and strives to eliminate them. The counselor often provides a closer relationship between employees or between the employee and his immediate superior.

It is impossible to overemphasize the important place the first-line supervisor occupies in fulfilling the wants of the workers. But it can be stated that the most important *single* factor determining an employee's satisfaction in his work is his relation to the first-line supervisor. The first-line supervisor is the only part of "up-the-line" authority with which the worker has real flesh and blood contact. To the employees the supervisor is the personal representative of the "Company" and all that that word signifies. It is he who must answer to the problems of the workers. Further, he is the one who gives commendation for work well done—who is in the best position to influence the "sentiments" and "attitudes" of the employees.

Worker satisfaction or dissatisfaction cannot and does not stem from such vague generalities as "company policy" or "progressive personnel programs." It grows and develops from the way the workers are treated. Actions in these situations literally shout louder than words. The War Department is engaged today in a vast supervisors' training program from which we expect to reap the harvest of greater morale.

Some managers still claim that the size of the pay envelope is the major demand which the employee is making of his job. In terms of "sentiments," "attitudes," and "feelings" which the worker develops, this is far from being generally true. Most persons want the satisfaction that comes from being accepted and recognized as people of worth by friends and work associates. Money is but a part of this social recognition. The way they are greeted by their boss, being asked to help a newcomer, being asked to keep an eye on a difficult operation or procedure, being given a job requiring special skill—all of these are acts of social recognition. They give people insight concerning their own standing in a work group. On such things does morale rest. And morale is the important element in the psychological factors concerning employee absenteeism.

It seems to me that the solution of the problem of reducing avoidable absenteeism lies in finding ways of stimulating the inclination to work To do so constructively means an acceptance by management of the maxim that the worker is impelled by an inner urge to find an environment where he can take root; where he gets a sense of belonging; where he has a real function; where he sees the purpose of his work and feels important in doing it.

Psychiatry

LIEUT. MEYER BROWN, M.C., U. S. NAVY, discussed the "Role of Psychiatry in Absences."

In industry the psychiatrist encounters three types of patients. The smallest number comprise the first group, namely those who enjoy good mental health up to a certain point in time, when they begin to show signs of mental disorder. This disorder may be of varying degrees of severity, persist for varying lengths of time and leave the victim with varying degrees of permanent disability. The early detection and proper treatment of these patients is purely a medical problem and can be as important to industrial production as the early detection and proper management of syphilis, tuberculosis or heart disease.

The second group of cases is much more numerous than the first and becoming relatively more numerous as the war progresses because such persons are excluded from the armed forces and find their way into industry. These persons present abnormalities of a mental nature from early life or birth which persist with little change for most of their life. The group includes the feebleminded, persons with a psychoneurotic personality and persons with a psychopathic personality make-up. The feebleminded have the mental equipment of a normal child in an adult body. The psychoneurotic is the excitable, emotional type of person who is unable to bear stress or strain and consequently shows an impairment in his industrial usefulness whenever events at home or at work are unpleasant for him. The person with a psychopathic personality shows numerous character traits of an undesirable nature which get him into numerous troubles at work as well as away from work. Because of his lying, cheating, gambling, fighting, grumbling, loafing or drinking he is a burden to his family and a monkey wrench in the gears of industrial production.

In the third category are normal persons who present numerous psychologic problems in their adjustment to an industrial life. The psychiatrist is in a position to appraise the intelligence and personality traits of the workers in this category, and realizes the great importance of many factors operating both inside and outside of the working place in determining the kind of performance that can be expected from a given individual.

In addition to being a valuable adjunct to the medical department of an industrial establishment for the detection, treatment and disposition of neuropsychiatric problems, the psychiatrist can serve industry in several other specific ways. He can carry on education among foremen, superintendents and executives as to the nature and manifestations of various mental abnormalities so that they will be more alert to cope with them in the proper way. He is in a position to assist the personnel department in its policies of selecting, placing and promoting employees, and to help it with disciplinary problems or inefficiencies of a troublesome character. Finally, he can be of assistance to management in those broad problems where the mental status of the employee is an important consideration, such as absenteeism, accident prevention, industrial fatigue, and industrial morale.

Absenteeism is currently one of industry's most annoying problems. This term includes not only absence due to unavoidable illness but also that due to avoidable disabilities, such as drunkenness, accident or venereal disease, and, as well, voluntary absence not due to disabilities of any kind. It is obvious that the solution of this problem is not going to come from the application of psychiatric knowledge or that of any other medical specialty, yet the viewpoint of psychiatry can be of great assistance. In the first place, short as well as long term absences due to unavoidable illness are not infrequently the result of disorders affecting the nervous system. Proper and early neuropsychiatric treatment of these cases can be just as effective in reducing absences as proper medical care can be effective in reducing absences from gastro-intestinal diseases. Relative to absences due to avoidable disabilities, we have mental problems as well as economic, social and general medical considerations to keep in mind. The chronic alcoholic is a psychiatric problem for diagnosis and treatment. Why the alcoholic drinks and what can be done about it is the province of the psychiatrist; sometimes he can be

The opinions or assertions contained in this expression by LT. BROWN are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

of great assistance in this direction. The accident-prone employee may be such because of a nervous instability with which the psychiatrist may be in a position to deal. He is often a person with a psychopathic personality, and, with psychiatric aid, may be placed in a position where he is less likely to be in an accident. Voluntary absences are similar to absences due to avoidable disabilities as far as their complexity of origin is concerned. Again the psychiatrist can offer no ready-made solution, but his point of view is of assistance in some instances. From a research standpoint studies are needed in various industries to assess the importance of neuropsychiatric factors as a cause of absenteeism, but there is little doubt that they compare favorably with disorders of any other part of the body.

It should be reiterated that psychiatry as a branch of medical science can be useful to industry, just as internal medicine or surgery. It is particularly well qualified to concern itself with problems of industrial production because it deals with abnormalities in human conduct, thought and emotions. There is a great need for wider understanding of the scope, aim and methods of psychiatry so that its benefits like those of other branches of medicine may be made available to industry.

MR. NED H. DEARBORN discussed "The Accident Factor in Absenteeism."

Mr. Dearborn made a very rapid summary of some of the important and outstanding facts with respect to industrial accidents.

Statistics show that in 1941 there were 141,000 deaths, nine million disabling accidents, 250 thousand non-disabling accidents, and 480 million man-days lost on account of industrial accidents.

In order to cope with this situation, an early reduction of all causes of accidents is needed. Extreme individualism is the cause of difficulty in some groups, and now we are learning that we can work together in industry, associations, in education, government, labor, and the other phases.

There is a possible correlation between ill health and accident proneness and this is a field which should be investigated. The agencies are now studying all causes, direct and indirect, in the occurrence of accidents and working out the relationships. In the meantime, we must all coordinate and collaborate in every way possible so that the various agencies can work to the best advantage. (The details of Mr. Dearborn's address are to be published in the Foundation Proceedings at a later date.)

Rehabilitation

DR. T. LYLE HAZLETT presided Wednesday afternoon at the panel discussion on "Putting Women, Older Men and Physically Handicapped to Work," introducing the speakers and outlining the method of procedure.

MR. E. P. CHESTER first discussed the subject "Industrial Medicine, Rehabilitation and the War Effort."

About 17 years ago I had occasion to place a young negro who had vision in one eye only, as a porter in a radio manufacturing plant. Several weeks later he was transferred to the condenser room. The operation he performed along with a number of other workers was the adjustment of bearings and alignment of plates of radio condensers. The workers were seated facing a small beam of light that came from a lamp concealed on the table in front of them. Otherwise, the room was dark. Closing one eye, and sighting through the plates, the workers made whatever corrections were necessary for good alignment. Meeting my man sometime later, I asked, "Sam, how did you get the job in the condenser room?" His answer surprised me. It was, "Well, I told the boss I could do more work than the others because I didn't have to waste no time closin' one eye!"

As originally conceived in 1920, Vocational Rehabilitation was a service intended to supplement workmen's compensation by providing for the retraining and re-establishment in industry of workers injured in the course of their employment. The program was soon expanded to cover persons injured in other than industrial accidents and persons whose disabilities were incurred as the result of disease or from congenital causes.

Even before Pearl Harbor it became apparent that persons with physical defects, not subject to service in the armed forces, would be needed in large numbers for selected service on the production line. Connecticut realized that every possible effort should be made to speed up the processes of rehabilitation and to expand the services available so that as many persons with physical defects as possible might be prepared vocationally for jobs selected on the basis of the physical abilities required in their performance. Need for combined medical, psychological and employer guidance to accomplish this purpose was indicated. Therefore, the State Medical Society, the Manufacturers' Association of Connecticut and the Departments of Psychology at Yale and Trinity were approached in developing "Connecticut's Man Salvage Clinic."

As a result of this program of Man Salvage Clinics, many workers with physical defects were placed directly in war production jobs, selected to meet their specific combined mental and physical ability. However, these clinics really served as a basis for training representatives of all interests concerned, rather than as a means of placing the individual handicapped potential workers, interviewed and evaluated. In other words, the candidates presented to these clinics represented *types* of physically defective workers who could be made useful to the war effort.

Up to this point in the rehabilitation program in Connecticut, services rendered, aside from supplying artificial arms, legs, braces or hearing aids where required for improved performance on the job, were entirely vocational in nature. From time to time during the past few months it has been called to our attention that workers were being rejected for jobs they could otherwise satisfactorily fill because of the presence of some physical defect which could be corrected in a relatively short time by proper medical or surgical treatment. There was no authorization for the expenditure of rehabilitation funds for such physical rehabilitation, but it was possible to arrange with private agencies in a few instances for the correction of some of these physical defects.

DR. JAMES H. BIRAM, Medical Director at the Colt's Patent Firearms Company, in Hartford, brought this matter to the attention of rehabilitation very forcibly about a month ago. He felt that there was urgent need for an immediate attempt on the part of rehabiliation to extend the program so as to include the correction of defects that were preventing employment. He wanted this done immediately as a means of increasing the manpower of the Colt's plant. DR. BIRAM stated his case so sincerely and convincingly that the only answer rehabilitation could give was an immediate decision to tackle the problem on a trial basis. Believing that other industrial plants would be interested in the plan, a meeting of representatives of industrial medicine, the general medical profession, hospitalization and industry was called to discuss the need for this physical rehabilitation service. They recommended the appointment of an advisory committee representing all interests concerned, and authorized me, as Director of Rehabilitation in the state, to select the persons to serve on this committee and to act as its chairman. The name of the committee was determined to be "Connecticut Wartime Manpower Rehabilitation Committee." This committee serves in an advisory capacity through the Rehabilitation Division of the State Department of Education.

A group of consultants, selected from various parts of the state, was determined necessary as a means of more speedily and effectively inaugurating the program. This committee of consultants was appointed and a combined meeting of the central committee and consultants was held Wednesday, November 4, in Hartford.

As the result of this meeting, it was determined that the correction of physical defects would be limited to the pre-employment group, representing the following types of defects: (1) Cardiac conditions and hypertension. (2) Hernia. (3) Vision. (4) Back condition. (5) Foot condition. (6) Diabetic condition. (7) Miscellaneous.

It was felt that a complete examination by a cardiologist, with report to the plant physician on arrangements made through rehabilitation, would increase acceptance of a greater percentage of workers with cardiac defects for

selected types of employment. It was also felt that a uniform treatment and the handling of vision correction through rehabilitation would be extremely helpful.

Selection of workers for this physical rehabilitation service would originate from two sources: (a) plant physicians, and (b) rehabilitation office. However, it was agreed that potential workers originating in rehabilitation as a source should be referred for consideration by a plant physician prior to the taking of any action on the part of rehabilitation.

A state-wide panel of doctors for various types of surgical or other corrective procedures should be provided through a canvass of competent men available and secured through recommendation of: (a) consultants of plant medical directors; (b) insurance carrier medical officials; (c) workmen's compensation officials; (d) specialists in various fields; rates of payment to the doctor to be made on the same basis as paid by workmen's compensation for similar service.

Hospitalization is to be arranged on an individual basis, ordinarily the client selecting his own facility, hospital rates to be the same as for workmen's compensation cases, and in general, the lowest private room rate.

Payment of both medical and hospital fees is to be made directly by the Rehabilitation Division of the State Department of Education, but a plan of repayment by the worker on an installment basis is to be arranged.

Through the State Board of Education funds will be provided to carry out this experimental program.

The program is now in operation, but is too new to give an accounting as to accomplishments. However, 15 persons have been provided surgical services and at least half of these are now working in the defense industries on jobs for which they were selected prior to the correction of their physical defect. The others are still in the hospital.

As a result of the nationwide publicity unexpectedly given to Connecticut's Man Salvage Clinic, many expressions of interest and requests for information have been received from industrial leaders over the country. Why? Industry needs manpower, needs it badly, and needs it now. Only last Saturday I conferred with an official of the large war industries in another state. He had written for advice on this problem of manpower through utilization of the physically handicapped. He did not know of the rehabilitation facilities in his own state.

In my opinion, rehabilitation over the country in the past has missed an opportunity for service by not spreading more widely information regarding services available to both physically handicapped potential workers and to employers. It is late, but not too late, to take country-wide action in this respect, and I hope the Industrial Hygiene Foundation of Mellon Institute will be willing to aid in the promotion of the rehabilitation program.

Women

MISS MARY ANDERSON, Director, Women's Bureau, U. S. Department of Labor, discussed the subject "Putting Women to Work in War Industries."

The present and future role of women in war production is a major one. Unless we recognize this in every possible way we shall fail to use the work power of women most effectively.

More women are working today than ever before in our history, over 14 million of them. About three million are on actual war jobs, but their numbers are increasing daily. From a half million in December of last year to four million in December of this year, means an increase—in one year—of three and a half million women workers directly engaged in the war effort. Some of these women are experienced workers using their peacetime skills in war production. Others have transferred their experience to new types of jobs. But now, more and more, we must call into our war plants women without previous industrial experience.

The fact that we must now expect to call into industry greater numbers of women without industrial experience brings us face to face with other problems. Some of these new workers are former housewives who have not worked in factories before; some are just out of school, and lack any kind of work experience. An inexperienced or "green" worker, man or woman, is a liability on the job until proper work habits have become second nature. New workers must be taught how to conserve their energies for efficient production, how to reduce accident and health hazards, and how to use safety devices. They must not only be taught *how* but *why*. This is management's responsibility—to induct new workers properly and to supervise adequately. War production schedules can never reach maximum if management does a poor job at this point.

Training schemes are essential even for single industrial jobs. Lack of proper introduction to the job certainly had much to do with the serious injury of a girl in a small-arms ammunition plant early this year. The girl was put to work inspecting cartridges after no more than two hours "preliminary training"—the "training" consisting of watching another worker on the operation for a short time. She received no instruction about the hazards of her job, nor the necessary safety precautions. She was wearing a wrist watch and a necklace. Powder shoes had not yet been issued to her. A few minutes after she began inspection on her own, she was picked up off the floor some feet from her work, her clothes and face covered with blood. Safety goggles had saved her eyesight, but she had a badly burned head and arms, with less serious burns on her face and body.

In contrast, many powder-bag-loading plants, where the operations are very simple, give beginners an opportunity to go through the routine movement until their hands do exactly what they should do. All through the training period, they use corn or some other substitute for powder. The girls are also taught something of the type of powder they will handle, and the reasons for the precautions taken.

Training for women new to heavy machine operations has been greatly aided in at least one plant by the use of a pocket-sized safety manual for women. It is attractively illustrated and gives the safety rules for each type of work on which women are employed in the plant, including regulations about work clothes.

The kind of clothes women wear on the job has come in for much more attention in recent months. Women's ordinary street clothes are not practical for machine jobs in a plant. The Women's Bureau has never encouraged a rule-of-thumb requirement for work clothes. We do say that clothes should be adapted to the particular job, with all the necessary safety precautions taken into consideration. The basic requirements for factory work clothes apply to both men and women—not too tight to hinder free movement, not too loose, so as to get caught in moving machinery; pockets only when they are not a hazard and then limited to certain types; no jewelry, including rings and watches; hair completely protected; and well-fitted shoes completely covering the foot, with extra toe or other protection where necessary. On some jobs trousers are most practical for women; on many other jobs women can wear a simple type of dress.

With intricate hair-do's the fashion, no article of personal protective equipment is of more immediate importance to women workers than the headgear designed for safety. It is necessary, if a hair covering is to be acceptable to workers, that it be designed for comfort and attractiveness as well as safety. Fortunately, all of these can go together. Comfort means that the headsize will be generous, and that in turn means that the hat will be thrown off if a girl does strike a part of the machinery. Comfort means, too, that it will be possible completely to cover the hair without ruining the hair-do, and that is a guarantee that the hair will not get caught in moving machinery. A good work hat should also have enough height so that it does not touch the top of the girl's head, and have enough stiffness so that it does not catch in revolving machinery. Hairnets alone do not meet these requirements, either for safety or attractiveness.

The Women's Bureau is frequently asked, "How can we enforce safety rules and the wearing of proper work clothes by women?" The answer goes back first to training for the job, or introduction to the job. From there on the whole problem of safety of women workers hinges on supervision. The supervision of women presents problems little different from the supervision of men. However, if the fore-

men resent the introduction of women into the plant—whether consciously or unconsciously—or if the men themselves dislike the presence of women, there is not likely to be the smoothness of operation that results in adequate production and safe methods.

Beyond the plant gate, unsatisfactory living conditions take a heavy toll in the health and industrial efficiency of women workers. Some women carry heavy home responsibilities in addition to full-time jobs. Women workers also have certain housing and recreation needs somewhat different from those of men. In some of our war industry areas, many workers are young women away from their homes and families, living in crowded rooms with several others, without adequate opportunities for good meals at reasonable cost, without opportunities for wholesome recreation. Such conditions make it likely that tuberculosis—to mention only one disease—will increase, as health authorities predict it will. Tuberculosis deserves special attention, because large numbers of women workers are within that dangerous age range most affected. Management, workers, local communities, state and Federal agencies, must combine forces in attacking conditions outside the factory which lead to illness, absenteeism, and less production.

The important thing to keep in mind now is that women are on the job in the war industries; they are turning out the quality and quantity of work the war demands. The nation will need their particular strength and ability even more as time goes on. It is only sound sense to do everything possible, within the plant and beyond it, to safeguard their health and efficiency for victory.

DR. J. M. CARLISLE commented briefly on his experience. Among the things found to be important in the use of women employees is the complete physical examination and a job analysis. This was supplemented by sympathetic work supervision. It is recognized, however, that where large numbers of women are working, it may be only practical to do what is known as the screening examination.

DR. E. R. A. MEREWETHER, of Great Britain, (Medical Inspector of Factories) commented on the experience in Great Britain with reference to the kind of work done in putting women, older men and physically handicapped to work. Employment in Great Britain is now managed by the conscription law, which provides that the employee must apply at the labor exchange. Women register at the age of 19, and a history of the education and the background is taken. The woman applicant is assisted in the choice of an occupation, according to her ability and according to the demand for the kind of labor which she can do. Laws relating to protection, training, and knowledge of running of machines, and on other subjects, including lifting of weights, with certain specific regulations, are put into effect from time to time. It is most important to know the meaning of regulatory provisions.

The highest accident rates occur in white males and young persons. The biggest rise in accident rates has occurred among females because of transfer from non-hazardous to hazardous industries. Certain details were mentioned with respect to women in industry, particularly the trouble encountered in getting women to wear caps and special shoes.

DR. ANNA BOETJER, as an additional member of the panel, proposed the question as to why there is such a big difference in the absenteeism rates as between men and women—certainly women do not have a greater respiratory disease rate nor industrial poisoning rate—and leaving out the strictly female difficulties which do occur, it was difficult to understand why women should have such a higher rate of absenteeism.

The question was not satisfactorily answered, although suggestions were made to the effect that there are differences in nutrition, that women are lower in weight than men, and are commonly on poorer diets.

Nutrition

DR. ROBERT S. GOODHART outlined "A Practical Nutritional Program for Industry."

Our government has not been ignorant of the problem of nutrition, and in 1941, began an organized effort to see that the nutrition of the people is protected during the war years. The problem here has been attacked mainly by educational methods because, to date, there has been an adequate food supply. In Great Britain education has been used from the start, but actual food rationing and canteens were also included almost immediately, because there were additional prime problems of supply and of distribution. The modes of attack in the two countries differ somewhat, but the ends both are trying to achieve are the same. As this war goes on certain foods may become more scarce, there may be more extensive rationing, and we may find it necessary to adopt methods similar to the British to insure that certain types of workers, the people who are behind the production of war materials, get the foodstuffs they need.

Since 1941, the Nutrition Division of the Office of Defense Health and Welfare Services has been actively engaged in teaching the people how to select, purchase and cook their food. The country has been divided into 12 regional districts, in each one of which is located a representative of the Nutrition Division of the Office of Defense Health and Welfare Services.

There must be, in addition to a campaign directed toward educating the consumer, an active effort to educate the producer, the processor, the distributor, and the caterer to provide the right food at a price that people will pay or can pay.

There is also the education of commercial caterers, including the proprietors of hot dog stands, coffee shops, and similar places in the environs of plants. They are extremely important. Sources of control exist through the local and state health authorities. With the proper stimulation from concerns of importance in the community, the local health authorities may prove to be a great help in improving situations in local restaurants.

Education is not the whole answer by far. One must also make sure that the worker has a chance to get the food he needs.

Where a cafeteria exists, it should not only be under the direction of somebody who knows nutrition, but the men should have the opportunity to patronize the cafeteria. There are plants with 20-minute lunch periods, where the men, if they wish to use the cafeteria, must count on standing in line for 10 or 15 minutes in order to get fed, and then they must get back to work on time. The cafeteria is out of the question for them. In setting up a cafeteria, or any type of eating facilities, one of the first things to bear in mind is the length of the lunch period.

Various studies have shown that it takes the average industrial worker 10 minutes to eat his lunch, so I think that any plant considering putting in eating facilities must allow that 10 minutes' margin, adding extra time—depending on how long it takes the man to get served, to wash up, and to go to and from the lunch room.

A few words about cold lunches. Many people have the idea that a good meal has to be a hot meal. There is nothing intrinsically meritorious about a hot meal. A hot meal can be a very poor one. The dinner pail and cold lunch should be improved, rather than condemned. The hot meal in some instances is certainly to be condemned, particularly when it remains on a steam table for an hour or more after preparation. You will find that a great deal of loss in vitamin content may occur under such conditions.

In addition to the problem of the regular mid-shift meal, there is the problem of between-meal feedings. The work on the industrial fatigue curve has, I think, pretty well shown that between-meal refreshments are desirable.

The Committee on Nutrition in Industry of the National Research Council has expressed its belief that it is desirable for the industrial worker to receive *five meals a day*, that is three small meals in the plant rather than one large mid-shift meal. In every instance where this has been tried, production has been increased. The Committee has also recommended that plants not have their meal periods spaced more than four and a half hours apart under any circumstances.

Between meal refreshments should consist of something more than candy and soft drinks. The idea that sugar is

a more important source of ready energy for industrial workers than the starches is fallacious. Bread is just as good a source of ready energy as any candy bar or soft drink. Between-meal feedings should consist of foods which are more nutritious than the highly refined sugars.

There is another extremely important problem in relation to nutrition of industrial workers, and that is the problem presented by shift work. Many plants having cafeterias have them open only for the day shift. This is particularly true of concessions that are run for profit, as the swing and the night shifts have not proved profitable enterprises during peace time. Generally the nutritional status of the swing shift worker is worse than that of the day shift worker. He frequently finds it difficult to get good meals before reporting for work and after leaving the plant in the middle of the night. When he leaves the plant, the restaurants are closed, the most he can get is a snack. He can't go home and get his wife out of bed and have her prepare a meal for him.

If the plant recommends to its swing shift workers that they get a good meal before they go to bed at night, I think it's up to the plant to see that some provision is made for them to get that good meal. Arrangements might be made with a neighborhood cafeteria to stay open, guaranteeing the management a certain amount of business and getting the men to cooperate, or the plant may arrange to have its own cafeteria open for these men so that they can get a good meal when they go off work, or right before they do go off. I think the shift problem is an extremely serious one, particularly as in many industries it is the custom to put the least experienced workers on the swing shift.

There's another problem in relation to shifts and that is the rate of change. Some plants change their shifts every two or three weeks. Such rapid changes have generally proved to be inefficient. Highest production is most often maintained when the workers are kept on one shift for a reasonably long period of time. It is desirable that they be maintained on one shift long enough to become acclimated to the hours and work.

Manpower

DR. RUSSELL J. GREENLY completed the program with a discussion of the subject "Manpower Survey to Determine the Basis of Industrial Mobilization." A lantern slide demonstration was given showing the different forms used as records in registering employees and in putting on record the various types of services they can render. This gives a constant source of information as to kind of men available, also as to the kind of men who leave employment.

In anticipating the drain on manpower availability to be occasioned by the building of an army in excess of 10 million, it is axiomatic that a heavy percentage of the required military manpower must be drawn from those engaged in industrial employment. Accordingly, this accounting must provide a basis for the establishment of a system that would permit an orderly withdrawal of least essential men from industrial ranks in such a manner that the normal production or output would not be affected adversely, and at the same time provide for the armed forces men in accordance with military requirements.

The first step in the problem with which industry was confronted logically suggested that a survey of the manpower needed for operation at any given point be made in a manner commensurate with the goods manufactured for the specific war requirements.

Before pursuing the problem further, it was necessary to determine the magnitude and scope of the personnel problem with which the various operating units are confronted. For this reason the next sequential operation was to determine age grouping of the personnel then employed. This age grouping was so arranged as to reflect age brackets as encompassed by selective service and training regulations, and also as additional changes were contemplated in age eligibilities that would be required for the full prosecution of the war. This age grouping is basic in determining magnitude of the training effort required of industry in discharging the obligations imposed by the selective service and training act. After determining the number of personnel eligible for duty in a military capacity, the next operation was to categorize the eligible according to their essentiality to the industry spelled off in terms of training periods prerequisite to preparing replacements.

In this evaluation, the position description or job content determinant which has been used for several years by this company in connection with job evaluation was immediately utilized. In this use it appeared reasonable to the management of Carnegie-Illinois Steel Company that this yardstick which had been tested and proved sound, and which gives weight to such factors as training time required, educational requirements essential and preferred, job duties anud responsibilities, promotional sequence, and other similar factors, should be used in determining the essentiality of any given registrant. With the position description as a basis, preparation of an organizational chart depicting a preferred promotional sequence is established covering all positions and is used to reflect the determined training time prerequisite to successful fulfillment. It is imperative that these training periods denote the time actually required rather than that desired under normal operating conditions.

In order that the occupations may be segregated expeditiously and for comparative purposes between departments, operating units, and jobs, a color legend is used as follows: white covers break-in up to three months; green, three months minimum; yellow, six to nine months; turquoise, one year minimum; orange, one and one-half year minimum; red, two years minimum; gray, three years minimum; brown, three and one-half years minimum; and blue, five years and over. The basic value in the graphic presentation of the departmental occupations lies in the picture afforded management of the individual status of any given occupation within the chain of operations affected. This picture, in turn, can be presented to selective service officials, the Manpower Commission, or other interested agencies and reflect an industry-wide presentation behind which can be silhouetted the importance of an occupation to the over-all production effort.

As an additional information factor, there is next prepared from the occupational breakdown charts a graphic presentation of the number of employees according to the training time required to effect replacement. By carefully reviewing the facts thus enumerated, it is possible for a departmental supervisor to survey their organization and to gauge the number of replacements and the time required for training with a satisfactory degree of accuracy.

It remains now only for this supervisor to utilize the tools as described, and to categorize properly any individual within his organization accordingly. From this perusal the degree of skill and the essentialities of the operation of any individual are readily determined. The possibility of obtaining replacements in the labor market is ascertained by the company personnel officers utilizing the facilities of the U. S. Employment Service. If this request reveals no adequate replacement, an occupational deferment request is justified for that period of time required to train another individual.

The formal steps in initiating such a deferment request are handled through the medium of the Industrial Relations Department and are made in accordance with established regulations. One function of the analysis presented is to predict the incidence of selective service losses. The ultimate purpose, however, and a more important one, is to enable management to accelerate the release of men for duty with the armed forces without disruption of productive work.

The joint objective of both management and selective service officials in this cooperative venture is to provide an adequacy of manpower for the army and industry. It is apparent that the analysis will serve its purpose when an over-all employment and training program is geared to the facts indicated by the survey results. It is possible to reduce the training time required by intensifying training and employing such methods as job information tests to improve the measurements of learning ability and keep the level of job proficiency, and likewise facilitate the selection of the most likely candidates for replacement purposes through the utilization of a sound testing program. These tools or techniques, however, are essentials of good man-

agement and are mentioned only in their relationship to the success of any industrial training program.

Carnegie's system is not considered a panacea for all problems attendant on the present labor supply situation, but it does represent an approach considered fundamentally sound and which has met with acceptance from other industries and interested governmental agencies. The adaptability and merit of this program are aptly demonstrated in the manner in which it has served its purpose. From the service flag that flies from the mast at the General Offices, it will be seen that 10,464 former Carnegie-Illinois employees are now serving in the armed forces. Yet this tremendous loss of manpower has been consummated without detriment to production output. Our part in the program of industrial mobilization is a matter of record. Time and time again the yield from various operating units has been raised far above normal anticipation. The practical application of our manpower program is verified by the manner in which employees have been made available to the armed forces, while the production of steel and steel products continues unabated.

The possibilities for national adoption of the Carnegie system were first appreciated when reviewed by a group of western Pennsylvania congressmen during their tour of several of our steel-producing units. Upon the return of these gentlemen to Washington, they recommended to Donald Nelson, Chairman of the War Production Board; General Lewis B. Hershey, National Director of Selective Service; Paul McNutt, Chairman of the War Manpower Commission; and General Frank McSherry, Director of Operations, War Manpower Commission, that the Carnegie plan be studied and evaluated from a national viewpoint. It was suggested that representatives from Carnegie-Illinois Steel Company present the method for critical review by this committee.

Following the presentation, the plan having met with the approval of the War Manpower Commission, Selective Service, and the War Production Board, it was recommended to Walter S. Tower, President of the American Iron and Steel Institute, that the plan be developed as an industry approach and that the American Iron and Steel Institute act as the clearing agency. The assignment was accepted by this organization and a program assigned to committees for development.

Notes on Dentistry in Industry

DENTAL disorders accounted for the same amount of lost time as did tuberculosis, according to the medical consultant of a large number of industrial plants after reviewing records of time-loss due to illness of seven or more days' duration; compared to the thousands of dollars spent on tuberculosis control and treatment, only pennies were spent on dentistry in industry. . . . PLANS are under way to form an organization of dentists engaged or interested in industrial work. The proposal will be presented at the meeting of the Chicago District Dental Society in Chicago, February 22. . . . TWO state health departments, Illinois and Michigan, will assign dental personnel for full time work on the promotion of dental programs in industry. These states have completed plans for cooperation between the state health departments' industrial hygiene divisions and dental health divisions in developing plant dental programs. DR. C. F. DEATHERAGE and DR. M. H. KRONENBERG, in Illinois, and DR. W. A. DAVIS and DR. K. E. MARKUSON, in Michigan, expressed the belief that workers' dental disorders are an important cause of lost time and inefficiency in industry.... THE promotion of dentistry in industry was discussed at a meeting of dental directors from the state health departments in U. S. Public Health Service District No. 1, in New York City, December 7. The states represented were New York, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New Jersey, Pennsylvania, and Delaware. It was the consensus that industrial dentistry was one phase of public health dentistry that should be stressed as essential to war-time needs. . . . DR. A. T. MCCORMACK, Health Commissioner of Kentucky, DR. W. E. DOYLE, Director of the Division of Industrial Hygiene, and DR. J. F. OWEN, Director of the Division of Dental Health, plan the development of industrial dental programs in Kentucky. DR. DOYLE has already been called upon to aid in instituting a dental program for a group of miners in western Kentucky.

From *Industrial Hygiene*, December, 1942.

THERMALS and DOWN-DRAFTS

THE PRAYER of the Earl of Richmond on the eve of the battle at Bosworth Field (Richard III, Act. V, Sc. 3) is singularly appropriate at this time:

> O Thou, whose captain I account myself,
> Look on my forces with a gracious eye;
> Put in their hands thy bruising irons of wrath,
> That they may crush down with a heavy fall
> The usurping helmets of our adversaries!
> Make us thy ministers of chastisement,
> That we may praise thee in the victory!

SOME companies require employees to telephone in their reasons for not coming to work. Here are the reasons so conveyed, during a couple of hours on a rainy morning last month, by those who had not shown up on their jobs in a large plant doing war work:

Employee Reason	Expected to be absent
1.—"teeth removed"	—one day
2.—"cold"	—day or two
3.—"sore throat and cold"	—day or two
4.—"attend to some business"	—one day
5.—"cold"	—one to three days
6.—"cold"	—one to three days
7.—"personal reasons"	—
8.—"baby died"	—several days
9.—"cold"	—two days
10.—"cold"	—one day
11.—"cold and sore throat"	—
12.—"sick"	—one day
13.—"pain in back—lifting"	—one day

A personnel executive, to whom absentee excuses of all kinds are an old story, was talking over the matter with a friend of his, an engineer. Referring to such reasons as the 13 above listed, he pointed out that these are rarely anticipated by any kind of notice the preceding day, and that, so far as they involve preventive opportunity or remediable conditions, the medical department doesn't learn of them until after they have occurred. The engineer remarked that he could sympathize with one of the absentees certainly and a second one probably, but that—human nature being what it is—the reasons given by the others, particularly the "cold" so often invoked, reminded him of an incident in his own experience. One day, years ago when he was running a steam-shovel gang on railroad construction, a big Irishman accosted him:

"Are yez hirin' any min?"

"Yes," was the reply.

"An' what do yez pay?"

"A dollar seventy-five."

"An' faith an' I'm glad t' hear it," said the big fellow. "I just passed the section foreman up th' way, an' I sez to him:

"'Are yez hirin' any min?'

"'We are,' sez he.

"'An' what do yez pay?' sez I.

"'It's the dollar tin,' sez he.

"'An' what's th' tin for?' sez I.

"'Aw g'wan, ye son of a ....., ye don't wanta work,' sez he."

IN SPITE of the progress of social experiments, there are still a good many people in this country who are so well aware of the history of its institutions, that they will really find it difficult to believe that the paper abstracted at the end of the A.P.H.A. proceedings at St. Louis, (page 67) was delivered by its author seriously and with a perfectly straight face.

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Preventive Surgery

AS DR. HOOPER remarks (page 4), the term "prevention" and its implications are now almost ubiquitous in industrial medical literature. Formerly, and even until a few years ago, this term was coupled with industrial medicine and surgery in a critical sense; the lack of prevention in this field was being deplored. The situation, however, has become so far improved that the urge is no longer on account of the lack of any prevention, but rather on account of the increasing need for more, much more, of what there is. Prevention is the battle cry, as it were, of the war effort; and industrial medicine and surgery is being spurred, on every side and by all agencies, to become *preventive* medicine and surgery in industry.

This suggests several things. One is that, as to *preventive medicine*, it is now well-known and almost generally understood. Another is that, as to surgery, the reparative is being well handled. These two need not be elaborated.

The third, however, has to do with the meaning of "preventive surgery." It is possible, of course, that the constant use of the term "preventive medicine and surgery" means preventive industrial medicine in general as it includes both medicine and surgery. If that is the case, then the term "preventive industrial medicine" would serve with full meaning; it would avoid the repeated, and possibly inspired, suggestion of the phrase "preventive medicine and surgery" that there is such a thing as preventive surgery *per se*.

The connotation of the words "preventive surgery" would invest surgery with a preventive capacity. This seems anomalous on its face. The definitions hold that surgery is the branch of medicine that treats disease by manual and operative procedures. Thus there is no surgery until there is something that requires surgery. Operations to prevent recurrences and operations to rehabilitate are still surgery; the extent to which they can be called "preventive surgery" nowhere near fits the intentions of those who continue to use the phrase. It is conceivable that the correction of dental defects—particularly as such correction is invoked to head off the potentials mentioned by DR. HOOPER—would be preventive surgery in a real sense. But even this, for obvious reasons, is a compromise meaning.

SO MUCH for literalness of expression. Vastly more important is the fact that the phrase "industrial surgery" is likely to acquire a significance, of its own, to come into a meaning consistent with the rapidly expanding future of industrial medicine. For a new idea is in the making, and showing progress. The full grasp of it requires an opening up of the traditional conceptions of surgery, and a transfer to the surgeon himself of some of the broader meanings of the word that describes what he does. The emphasis will be increasingly on him as capable of performing operations; decreasingly on him as actually doing them. This new idea of preventive industrial surgery will involve the prevention in industry of conditions that will require surgery unless they are forestalled. The industrial physician has long been preventing situations which, if not headed off, would require medical, as distinguished from surgical care. He oversees the working environment to exclude occupational diseases —and, as nearly as possible, non-occupational diseases arising from working conditions—which, were they not excluded, would develop the need for treatment. In this capacity he is still the physician. By the same token the industrial surgeon will be expected to oversee the working tools which, if they are misused, and the working habits which, if they are wrongly fixed, will cause accidents developing the need for surgery. In this capacity he will be no less the surgeon.

Against the objection that this will make the industrial surgeon also a safety expert, there are enough instances of the successful combination of the medical, surgical, and safety functions in one medical director, to prove that such a combination can be soundly made. These men, from the increase in the scope of their responsibilities, have suffered no depreciation of their surgical skill but, instead, have experienced a huge appreciation in their faculties of surgical judgment. Far from being visionary, this triple-handedness of the industrial surgeon of the future is already a trend. Among the larger companies the impulse is toward it rather than away from it. We do not know that the first users of the phrase had any such possibility in mind, but we do believe that the implication which may have been launched pregnant with paradox will eventuate in an important and war-timely professional characterization.

IS IT POSSIBLE that there is an attitude of shocked surprise in the reaction of governmental agencies in general to the facts which they embody in their reports, when those facts are derived from the *human* equation? As one example of this reaction, a recent dispatch to *Chicago Sun* carries the news that 6% of the workers in war plants in and around New York City, are absent each day because of illness or for a variety of lesser reasons; that there is a greater share of absence among women than among men, and that the day after payday is the worst. Such data have always existed and have been brought out in various studies previously. In general, they are an old story, only new because newly encountered.

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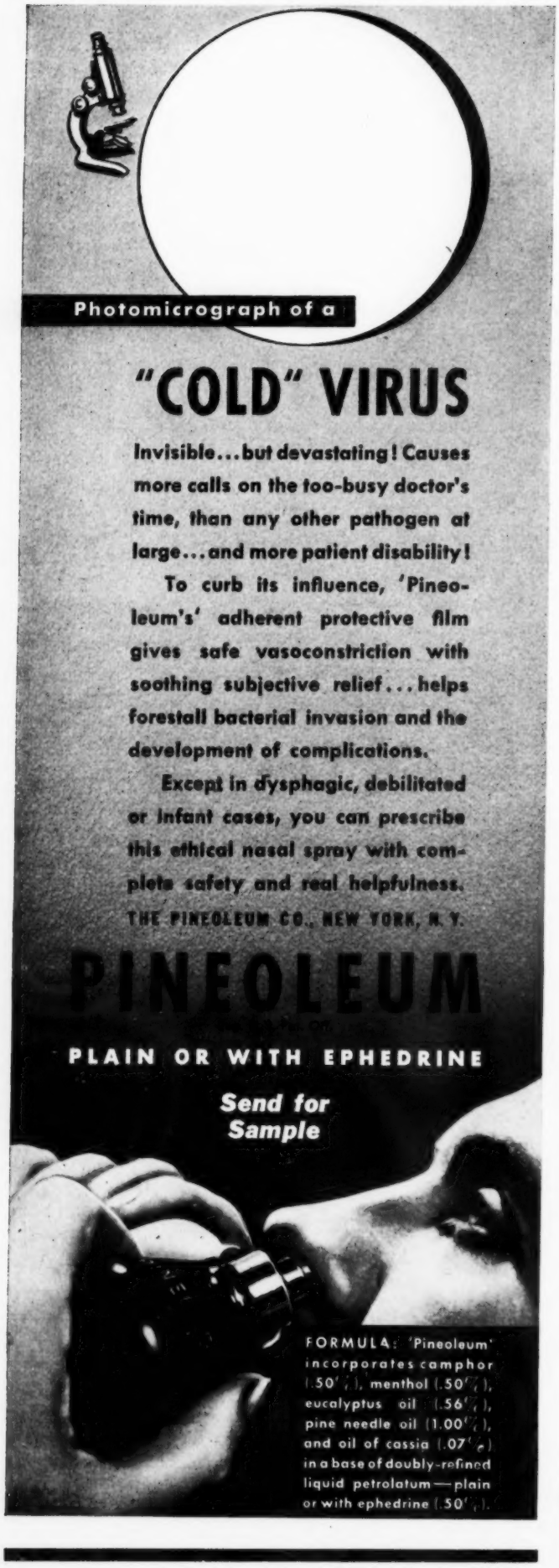
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Industry, the War, and Tuberculosis

CLIFFORD KUH, M.D., DR. P.H.,
Chief, Bureau of Industrial Health,
California Department of Public Health

THE control of tuberculosis in wartime industries should be considered part of a general health program. I believe one can interest industry in a general health program more easily than in the control of one specific disease, which may seem remote from the immediate problems of industry. But industry is interested in production, in decreasing absenteeism from all causes, of which tuberculosis is one. Yet the war effort tends to defeat its own purpose by raising hurdles which must be jumped. Workers change jobs, break into new work, work long hours, on the night shift, travel many miles to work—all of which increases the strain on the human organism and tends to decrease efficiency when efficiency is needed most. Inexperienced help produce less but work harder. There is overcrowding, living in trailers, poor sanitation with its danger of epidemic threatening to increase absenteeism and decrease production. There are split homes in which both parents are working, and when the housewife works, the cook is out and nutrition may suffer. There are inadequate medical and public health facilities both in the community and in the plant, as well as inadequate control of occupational illness and accidents.

Labor shortage necessitates the employment of women, of racial groups, of arrested cases of tuberculosis, and other handicapped individuals. Among women from 16 to 30 years of age, the tuberculosis death rate is higher than in men of the same age group, and many of these women will be going into industry. Among negroes, the tuberculosis death rate is higher than among whites. Arrested cases of tuberculosis, without proper control, will break down. Dr. William P. Shepard, of the Pacific Coast Office of the Metropolitan Life Insurance Company, has pointed out that all this contains the makings of a vicious cycle—inexperienced employees of an age, sex, and race particularly susceptible to tuberculosis, undeveloped health safeguards, no provisions for locating early cases of tuberculosis or of reactivated cases; more contact; more tuberculosis.

The experience in other wars bears this out. We are indebted to Dr. Shepard for some figures. Canada has been at war three years. Among 71 million Canadian policyholders of Metropolitan Life the death rate from all forms of tuberculosis increased 18.7% from 1940 to 1941. In England and Wales, among the general population, the increase from 1939 to 1940 was 13% for males, and 7% for females. In Scotland, for the same period, the general rate increase for both sexes combined was 14%. In the last war from 1913 to 1918 the increase in the tuberculosis death rate among German women was 75%; in Brussels, for approximately the same period, 220%; in Warsaw 275%. In neutral countries the rate for the Netherlands was 50%, and for Switzerland 6%. In the United States, although its participation in the war was brief and relatively easy, the increase was 5% from 1916 to 1918.

WHAT are we going to do about it? As I have said, we must interest industry in a general health program. And what does a general health program include? Pre-employment examinations; periodic health examinations, including frequent laboratory tests when workers are exposed to certain toxic sub-

Presented at a Meeting of the Directors of the Contra Costa Public Health Association, Martinez, California, October 21, 1942.

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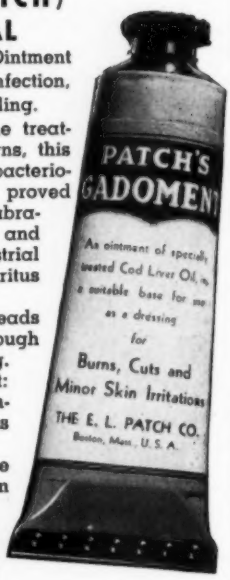
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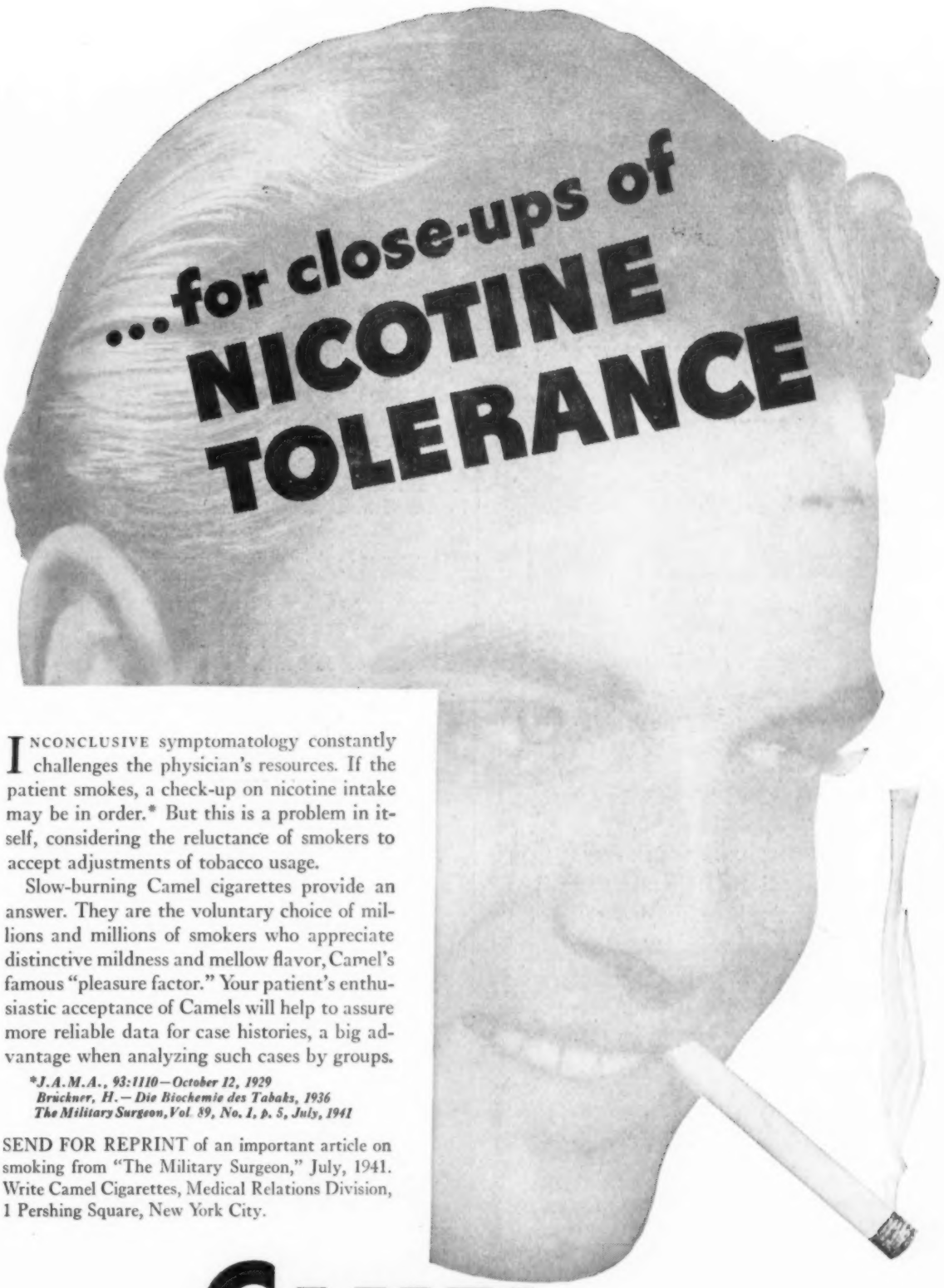
stances; examinations on transfer to work requiring greater physical effort; compliance with established standards for ventilation, illumination, and sanitation; medical facilities including first-aid rooms and provision for treatment of minor illnesses for which the worker would not ordinarily see his family doctor; plant inspections; health education urging use of community facilities for health and recreation; proper hours of work (not over eight hours a day for six days out of seven); rest periods; records of accidents and absenteeism to provide information as to primary cause; good nutrition; control of environment dusts, particularly silica which predisposes to tuberculosis.

Let me emphasize certain aspects of such a recommended program. As you may know, a symposium on tuberculosis in industry was held at Saranac Lake in June, 1941. The deliberations took a week and were the basis for a good-sized volume. The conclusion reached was: Aside from nutrition and socio-economic factors, silica was the only other factor which had a recognizable effect on susceptibility to tuberculosis. Many preconceived notions were exploded; lead, fumes and gases, injuries to the lungs, pneumonia, handling tobacco in cigar manufacture, cement dust, high temperature and humidity—none of these had a clearly demonstrable effect on the incidence of tuberculosis. Apparently even fatigue, judged by results of a study on the effect of exhausting work in the automotive and steel industries, did not reflect an increase in the tuberculosis rate. There may have been extenuating factors. These workers may have been stronger and better nourished than the average. We know that the avoidance of fatigue is important in the treatment of tuberculosis, but, so far as the incidence of the disease is concerned, we have no knowledge that fatigue is a factor. Based on the conclusions reached at this symposium, what would be the most important elements in a program to decrease the incidence of tuberculosis in industry? They would be (1) environmental control, (2) good nutrition, (3) pre-employment examinations to eliminate contact with the active case.

Let us consider these in order. Environmental control is fairly good in California so far as tuberculosis is concerned. There is not much silicosis in California. The wet process is generally used. The legal requirements are that not more than a half of 1% of silica be used in the parting compound. In the foundry of a large shipyard where the usual foundry procedures are employed, the workers have been exposed for many years, but chest x-rays revealed only one suspicious case, and the films of this worker, if anything, showed minimal disease.

As to nutrition, however, we feel today that the situation is more ominous. We have workers with notoriously poor food habits. Goodhart, in studying 33 industries found that less than 10 or 15% selected a half-pint of milk for their lunch, and many made other bad choices. It happens very often that there are poor commissaries in many of the plants. Dr. Francis M. Ballard, of our Bureau, has been giving some time to the study of the nutrition of workers and reports: "The half-hour lunch time has made it impossible to leave a plant or in many cases to walk the full distance of a plant and back in order to obtain the noon meal. The large majority of the men carry their own lunches. Many of these home-made lunches are whipped up affairs, perhaps adequate in calories but not in protective substances. The wife may be working also and so cannot be expected to do a very good job of cooking at home, preparing lunches, etc. Many of the men are not married and have no facilities for preparing lunches, even if they wanted to do



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Brückner, H.—Die Biochemie des Tabaks, 1936
The Military Surgeon, Vol. 89, No. 1, p. 5, July, 1941

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so. This group of men often have no breakfast or have only hotcakes and coffee. For the noon meal they have to rely upon the box lunch that is purchased near the plant. The latter lunches, sold for 25 cents apiece, are inadequate not only from a nutritional standpoint, that is, in respect to protective substances, but also from a caloric standpoint. In most of the plants the lunch must be purchased before the man goes to work. Then he must keep it all morning in some place near him. Milk gets very warm, unless he has a thermos bottle, and the food generally deteriorates."

What poorly run cafeterias have been available are, in some instances, closing for lack of help. In general, plants that have been long established have relatively good eating facilities. It is in the mushroomed plant that the real serious problem presents. More stringent rationing will further complicate the problem of providing the right foods.

We know what we want! We want cafeterias and canteens, but there may not be time to build them now. We want mobile units, but it may not be possible to obtain them. We want a nutritionist in the large plants. She may not be available. So, we must rely on educating the restaurant owners near the plants as to what to dispense. Something along these lines is being done by nutrition committees on the state and county levels. We also want clean facilities and clean dishes.

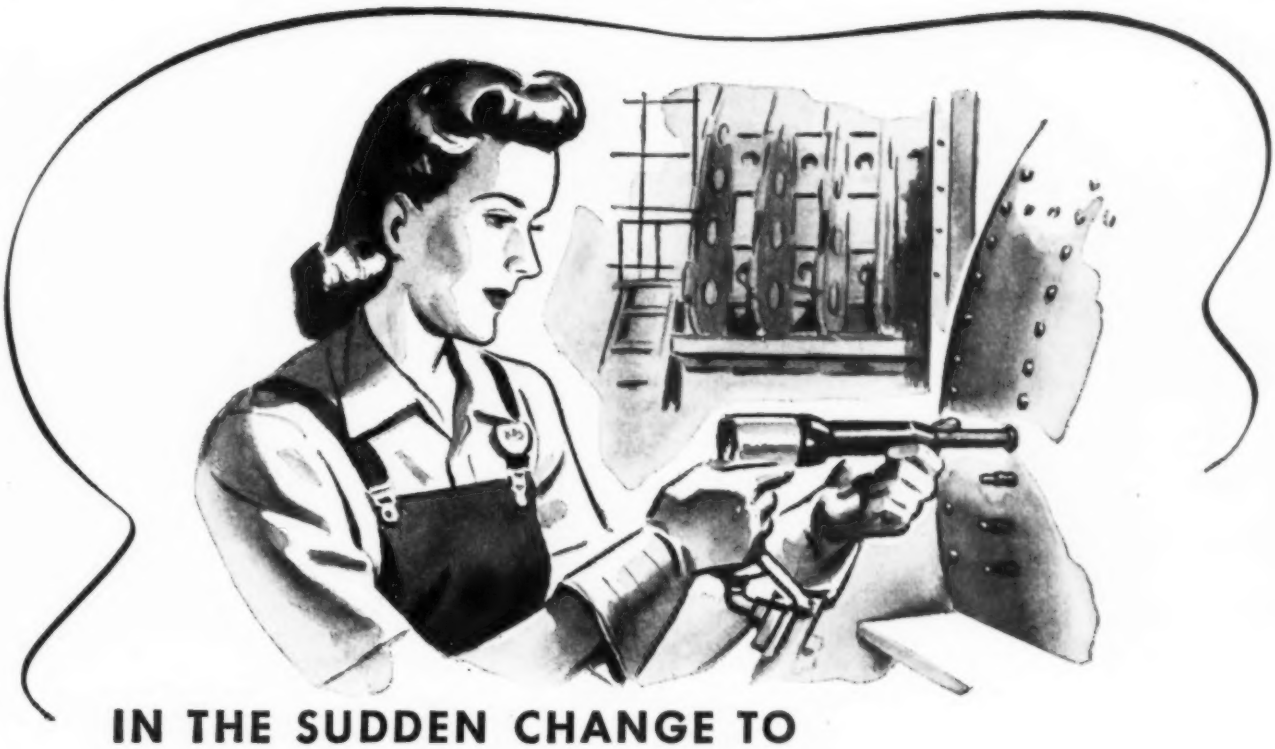
We must educate the housewife, too. From a practical standpoint, we must stress the importance of the lunch box. We have to reach the concessionaires who sell lunch boxes as well as the housewives who prepare them. It would be better if the concessionaires would eliminate the 25-cent lunch and increase the price to 35 cents or 50 cents. The workers can pay a higher price. The economic aspect is not so pressing now. Dr. Ballard, of our Bureau, says in his report that there should be some method of making the box lunch available within the plant at meal time, along with cartons of milk. An adequate distribution system would take care of this problem and would allow more time for the preparation of fresh lunches on the day needed.

We have to make readily available the food the workers should have. For example, milk. It has been found that if the workers have two drinks to choose from, they often select the more nutritious automatically. It would also be desirable if we could arrange with management to set a price differential in favor of the more nutritious food. We must also make food available for between-meal feedings.

We must find some one at the plant who will be responsible and who is able to spend the money. It might be management; it might be labor; it might be a committee of both. At one plant the facilities are provided by management, but the cafeteria is run by a committee of employees. They choose their own chef and his staff, but their committee lacks a nutritionist!

As you perhaps know, there is a great deal of literature available for the housewife. Largely, it is a question of getting this literature where it ought to be at the time it ought to be there. For example, the California Department of Public Health recently published a circular on the subject, which was recently distributed at a lunch box derby. Another circular bears the ingenious slogan: "Do you Pack a Lunch that Packs a Punch?" Another tells about the five-star lunch—plan the lunch the day before, have all the food and equipment conveniently stored in one place so the lunch may be packed quickly in the morning, wrap all dry food in wax paper, and so on.

As to the pre-employment examination, an unusual obstacle is raised in California which should eventu-



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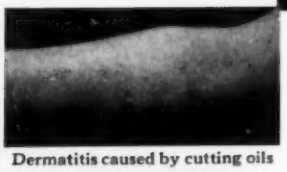

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ally be overcome, owning to the attitude of the unions. Apparently in certain instances in the contract between the union and management, the pre-employment or pre-placement examination is barred. One cannot detect the arrested case of tuberculosis or the active case in an applicant for a job without a pre-placement examination. Yet the employment of an arrested case of tuberculosis is perfectly feasible under proper safeguards. It has been suggested, for example, that such safeguards be: Avoidance of the graveyard shift; avoidance of oily, dusty atmospheres; of dampness; of marked changes in temperature; of excessive hours of work; of continuous standing or walking, and of weight lifting over about 30 pounds. The height to which weights may be lifted should vary with the history of the case. The worker who has been subected to thoracoplasty should not lift as high as one who has had phrenico-exeresis.

How about chest x-rays? They should be part of the pre-placement examination, particularly in certain industries. But in lieu of the pre-placement examination, the chest surveys are of particular value. In this respect the experience of the Alameda County Tuberculosis and Health Association, using the portable fluoroscope, is of interest. They surveyed industrial employees at their place of employment. I understand that the Contra Costa Public Health Association has already done this for school teachers. X-ray films were provided by the Alameda Association to supplement the fluoroscopic examinations in suspicious cases, the films being taken in the offices of private roentgenologists and paid for by the Association. Cases requiring referral were sent to private physicians or to public clinics. Among 5,611 employees surveyed, in 76, or 1.4%, was found some pathology, either tuberculous or non-tuberculous, requiring medical attention. The total cost of the survey was $2,368, or 42 cents per employee. To find each of the 76 cases cost $31.16 per case. Among the 76 were 27 active cases "of the reinfection type," and to find these, disregarding the others, cost $87.71 per case. This sum is not high when you consider the cost of treating a case and the amount probably saved by finding the case at the time it was discovered. The Alameda Association is now buying a machine to take 4 x 5 films, when the cost will be reduced to approximately 10 cents per employee, which is a remarkable saving. As you know, the Division of Industrial Hygiene of the National Institute of Health will lend a photofluorographic unit, together with a staff comprising medical officer, technician, and clerk, to state bureaus of industrial health. Our Bureau of Industrial Health is on the list for this unit, which can be made available to the Contra Costa Association.

Perhaps what I have thus far said is sufficient to bring out that the problem of the control of tuberculosis in industry is broad; that much more than environmental control is required today. And particularly is it necessary to overcome antipathy to the pre-placement examination. The California State Board of Health has just approved the appointment of an Advisory Council to the Bureau of Industrial Health. One function of the Council will be to assist the Bureau in planning this broad program. There will be appointed to the Council a specialist in tuberculosis. In the Council also will be representatives of the medical profession in general, of management, and of labor, and it is hoped that all these groups will see eye to eye the major problems involved, and the ultimate good to be attained by meeting on common ground. Our program will be directed to the solution of many health problems, among which the control of tuberculosis is an important one.

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The Kaiser Medical Problem

AT THE annual conference of Secretaries and Editors of Constituent State Medical Associations, Chicago, November 20-21, 1942, DR. FRANK H. LAHEY, Chairman of the Procurement and Assignment Service for Physicians, Dentists, and Veterinarians, in concluding his address on "War Problems for Medicine," introduced DR. JOHN HAROLD FITZGIBBON, of Portland, Oregon, as follows:

"Because we have had a dislocation problem in the State of Oregon; because we have a representative of the State of Oregon here who has met this problem, who has to leave this afternoon; because they have met it so satisfactorily that it might even be a suggested pattern for others who have to meet it, could we hear from him briefly on how they have met it in relation to the Kaiser shipbuilding program in Vancouver, Washington?"

DR. FITZGIBBON then spoke as follows: "Our problem in the Pacific Northwest is different, no doubt, from the problems elsewhere in the country. I am not advising you that our solution will be the solution to any of your problems. Perhaps our method of study may help you to arrive at a solution of your individual problems. The shipyard problem in the Pacific Northwest is not limited entirely to the Kaiser interests. The Kaiser yards have received the most publicity and are turning out the most ships and the fastest production. There are in the Portland area, in addition to the yard at Vancouver, Washington, and two Kaiser yards in Portland, several other small shipyards that are employing a vast number of men and women. The Washington problem and the Oregon problem are interrelated, so far as Vancouver is concerned, because Vancouver might almost be considered part of Oregon if it were not for the state line. It lies across the river from Portland, and the bridge between the two cities makes them almost one metropolitan area. However, the Vancouver problem is entirely different from the Portland problem, because Vancouver is a smaller city of about 22,000, with 20 to 25 physicians, about one third of whom are now in the armed forces, leaving a definite shortage. In Portland proper we have a medical center with a medical school, a large number of physicians, a metropolitan area which must be taken care of, plus patients who come from a distance in all directions.

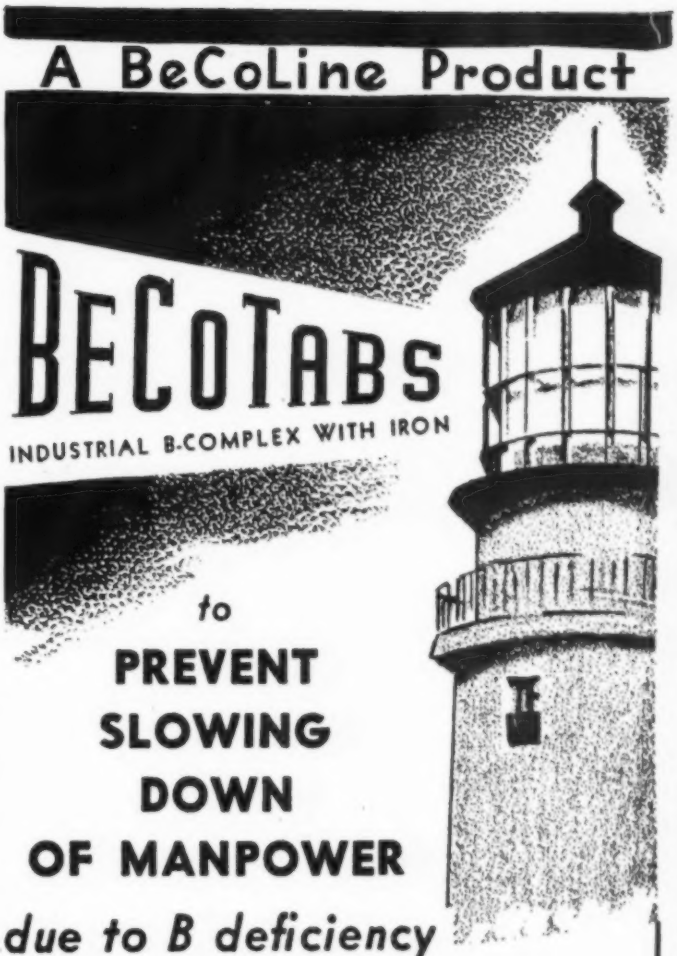
"There have been remarks in the press recently about the Vancouver situation which I feel are entirely unjustified. I know they are unjustified because the comments made were due to misinterpretation of Procurement and Assignment directives which were issued and which were followed by the Washington Procurement and Assignment men. In Oregon, when the Kaiser interests opened, a demand was made that the physicians take the Kaiser employees, their wives and dependents, on a family coverage basis. We were told that this would be done—or else! We did not know just what the "or else" implied, but we did know that it implied the building of a hospital or hospitals locally and the importation of salaried physicians to take care of these people. As a result of the efforts of the state and county medical societies, a contract was made with the Kaiser company whereby the employees who choose to be covered may be cared for under the Oregon Physicians' Service. This is a medical society approved plan operated under the board of medical economics of the state medical society on an entirely voluntary basis. Employees who do not want to be covered are not covered. There is no salary deduction unless the employee elects to be covered. A charge of 60 cents a week is made covering hospitalization and medical care. The Oregon State Association of Hospitals takes care of the hospitalization. The Oregon Physicians' Service takes care of medical care. They are entirely separate organizations associated in this problem. The care does not cover accidents on the job. The state industrial accident commission takes care of accidents on the job and we handle only sickness. Between the state society and the industrial accident commission there is ideal cooperation, so that expenses are pooled and apportioned according to the needs. Many of the employees are covered—perhaps

From *J.A.M.A.*, December 5, 1942.

30,000 or 40,000. Many, many thousands have not elected to take the coverage and are coming in as private patients. Our population normally in the metropolitan area is about 350,000. During the last year that population has increased to 450,000. Mr. Kaiser informed us the other day that additional employees are being brought in for further ways which are being laid, so that we shall have before spring an additional 90,000 to 120,000 people. We accept 90,000 as the most likely figure, which will bring our population to 540,000.

"Mr. Edgar Kaiser, the son, who is in charge of the Northwest yards, came to the Oregon State Medical Society on October 23 and stated his problem, his responsibility to these people, whom he considers individuals who have come there to help his organization in the war effort, and who we consider are medical responsibilities. He told us as nearly as he could what his future contracts would call for and what we could expect in the way of population load. He asked us whether we thought hospitals should be built and whether doctors should be imported. Out of this conference a committee called the Oregon War Emergency Health Committee, of which I am chairman, was appointed. This committee represents the state medical society, two county medical societies, a branch of the medical women's association, the dental association, the nurses, the licensing boards, medical, dental and nursing examiners, the public health agencies as represented by the state, county and city health officers, the pharmacists and the visiting nurses. We have 15 different health groups represented by their own appointees on the committee. The problem was presented to this composite committee, and a chairman from each group was told to go into his own group and appoint a subcommittee to carry out the investigation and bring in a report at the next meeting. The reports were brought in, compiled and discussed by the entire committee; then this working report was organized. We started first with public health. We realize that the public health phase is of the utmost importance, because the importation of people from all over the country brings all sorts of diseases, smallpox, diphtheria, malaria and we know not what else, including perhaps a great deal of tuberculosis. The county society urged the state, county and city public health agencies to take steps immediately to immunize as rapidly as possible all newcomers who are not already immunized against smallpox, diphtheria and typhoid, if thought necessary, and to take measures against contamination of various kinds. One housing project alone will house about 50,000 people, which is a small city in itself, in an area that has never had a physician or an office, or anything but a farm building or perhaps a fishing dock. The physicians of the city had a mass meeting—not a society meeting, but representing all the physicians, both society and non-society physicians—and went on record as offering their services gratis to the public health agencies to carry out this immunization campaign. We requested the press to help us. The contiguous hospitals will be enlarged. We have from the public health men definite plans for enlarging. We know where to put the partitions, how many beds to order, where the plumbing is to be.

"The problem of general hospital beds was the one we thought would be most difficult. However, the hospital association promptly brought back a statement of exactly how many beds it had, how many it had in storage, how many were ordered, how many were needed and how many rooms not containing beds could be used as hospital rooms for patients if the beds could be obtained. We found, to our surprise and joy, that we could immediately increase our hospital beds by 307; that we could, by changing one of the nurses' homes, which had been a hospital, back into a hospital and housing the nurses in barracks, add another 85 to 90 beds. By going to the county commissioners—the county hospital no longer has enough patients to keep the interns busy—we can perhaps get permission to put private patients in the county hospital and in the Dornbecker Hospital for Children. Another hospital, which had been closed several years ago and made into a home for unfortunate girls who were poverty stricken—there being no unfortunate girls who are poverty stricken now—can be returned to the status of a hospital, giving another 50 beds.



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"We had originally 550 physicians, or 727 persons to the physician. We have lost 150 already to military service and through death and disability, which gives us 1,125 patients to the physician. We have about 25 more men who will go into the services after processing which, with our additional 90,000 people, will then give us one physician to each 1,500 persons. The medical men have decided that they can and they will handle the situation on a private practice basis. The first step is to request the housing authorities to do something which they have apparently forgotten, to build doctors' offices in these projects and rent them to physicians who will go in and carry on private practice. Other physicians who feel they cannot spend full time have offered to go in on a part time basis. Three or four men will agree to handle one office and keep it going full time. The other men in town, particularly those in industrial areas, are willing to carry on evening office hours. Our big problem is the day worker. We must get as many man hours per worker as possible in order to keep up production. Our swing shift and night workers can come in as day patients during office hours, but the day workers who stay on the job must be seen after office hours. We feel that the local men should be given an opportunity to carry out this proposed plan before we ask the Procurement and Assignment Service and have men brought in.

"The dentists have not yet submitted their plan, but they say they are willing to do anything they are asked to do. The nurses have studied their situation. We are going to have to get more nurses' aides, more hospital lay workers, and change the type of nursing in the area. The nurses have suggested that if we will make some sort of arrangement whereby they can be utilized as nurses and not as janitors, maids, back rubbers, florists taking care of bouquets, telephone girls telling Mrs. Jones that Mrs. Smith is much better today, with visiting hours cut down and rugs taken out of rooms, and all sorts of frills omitted, they can get by. They are cooperating to the fullest degree, and I believe we shall have the nursing problem settled."

Kerato-Conjunctivitis

EPIDEMICS of kerato-conjunctivitis, the eye disease which appeared on the West Coast in September, 1941, have occurred in industrial communities in Michigan, New York, Connecticut, and other states. The duration of disability has been as long as eight weeks; the average about two.

A symposium on this disease was held at the College of Physicians and Surgeons, Columbia University School of Medicine, December 4, 1942, under the direction of the Division of Preventive Medicine, Office of the Surgeon General of the Army, and in conjunction with the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army. The program included clinical descriptions, epidemiological data, and recommendations.

Kerato-conjunctivitis begins with an edema of the eyelids, and the patient may believe that he has a foreign body in his eye. Such may be present, or there may be a history of an abrasion, but these factors are probably coincidental. The edema gradually spreads to the surface of the eyeball, secretions become increased, and, with the onset of secondary invaders, the discharge may become purulent. If a conjunctivitis does not clear up within 10 days, epidemic kerato-conjunctivitis should be considered. The original symptoms may be followed by folliculosis, and pseudo-membranes may appear. Other complicating symptoms, such as headaches, malaise, fever, and involvement of the regional lymph apparatus, are reported. Corneal opacities may follow in anywhere from 40 to 70% of the cases, and some of these may be permanent. The diseases to be differentiated are panophthalmitis, gonorrheal opthalmitis, streptococcic conjunctivitis, diphtheric infection, Staphylococcus infection, and allergy.

Dr. Murray Sanders stated that unless great care is exercised in the medical department, the disease may be carried from one patient to another by the hands of the attendants. An epidemic of 80 cases in the practice of one physician resulting from one unrecognized case could have been prevented by the use of ordinary soap and water.

The best treatment seems to consist of cold compresses, installations of atropine, and applications of sulfathiozole ointment. In more severe cases, x-ray seems to be effective in small doses. Dr. F. J. Waters, of San Diego, California, reports his best results with a 4 or 5% solution sulfathiozole sesquihydrate, and suggests the treatment be continued at least five days after the symptoms have gone.

Drs. M. J. Hogan and J. W. Crawford, in *War Medicine*, November, 1942, report an epidemic among, but not limited to shipyard workers. Although more than 200 patients were treated, the report is based on 125 seen and examined throughout the course of the disease. The authors review reports of other epidemics, one as long ago as 1899, and indicate that there is a great variation in the clinical picture. The disease is contagious but not to an exceptional degree. It is probably endemic in the Far East and occurs sporadically throughout the world. The incubation period varies from five to 12 days, commonly is about eight days.

Seventy-five percent of the conjunctival infections were unilateral. Diagnostic signs in the early stages are the glassy edema of the conjunctiva, involvement of the regional lymph apparatus, the lymphocytic type of conjunctival exudate, tiny petechial hemorrhages, formation of pseudo-membrane, and the lack of discharge. The severe conjunctivitis may or may not be followed by keratitis. Keratitis occurred in about 92% of the authors' series and began two to eight days after the onset of conjunctivitis. During the course of the conjunctivitis, the patients remained comfortable, but with the onset of the keratitis, pain, photophobia, lacrimation, and blepharospasm suddenly occurred. The corneal lesions were classified into three groups: (1) Tiny punctate infiltrates of the epithlial erosion type; (2) typical macular infiltrates 0.5 to 1.5 mm. in diameter; and (3) gross disciform infiltrates about 4 mm. in diameter, surrounded usually by small satellite macular lesions. Symptoms associated with the keratitis usually subsided in about a week, though the pain lasted two or three weeks in some patients. Slight malaise occasionally was present, but fever and other signs of toxemia were not observed.

Therapy is of little avail, except possibly in the early stages and in the milder forms of the disorder. The disease is self-limited. The ultimate prognosis is good as regards vision. Preventive measures so far have been ineffective. The authors suggest, however, that patients contracting the disease be isolated from fellow workers for at least 15 days, or until nearly well.

From *Industrial Hygiene*, December, 1942.

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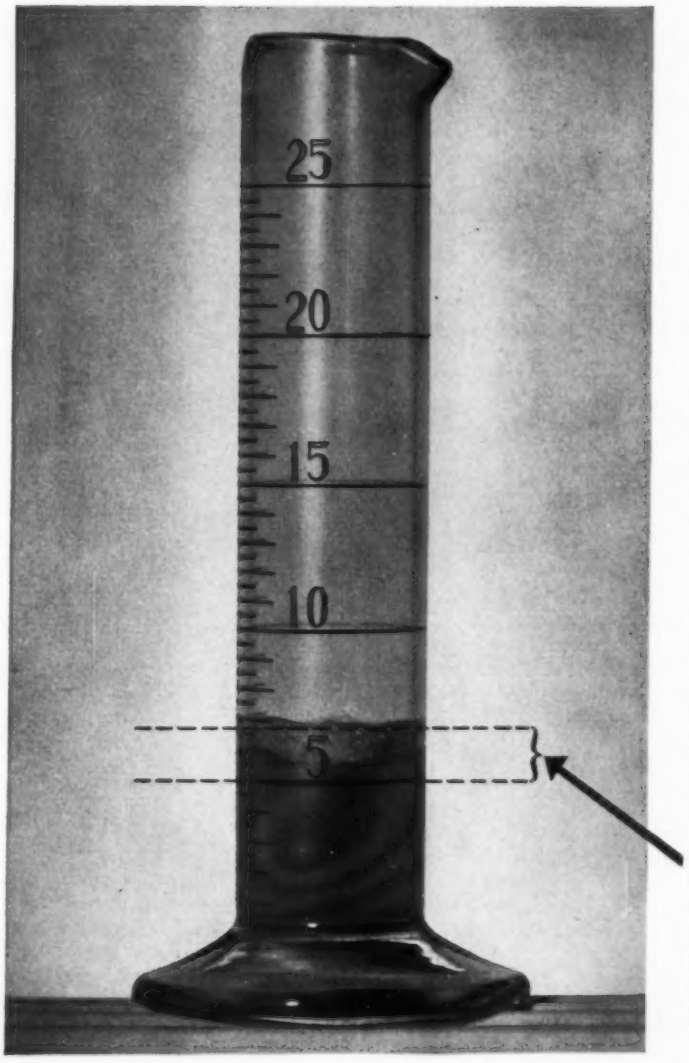

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INDUSTRIAL HEALTH and DISEASE

Women as Absentees

THERE seems little doubt that women are absent from work because of illness somewhat more often than men. *However, the reasons for this lie to a considerable extent in industrial conditions that can be improved.* For example, in a major aircraft plant where conditions of work are good it is found that even under the wartime pressures absences are no more for women than men—less than 3%. Similarly, in a company that employs hundreds of women producing precision aircraft instruments average absenteeism recently was found to be less than 1%.

In somewhat the same way as an improved machine or a readjusted method of handling a work process may require considerable adaptation in spacing, arrangement of tools and materials, or other plant conditions, it is clear that certain conditions of work must be considerably better adapted to the needs of women workers if the large supply of woman labor necessary for war production is to be secured.

A survey in 1935-36 by the National Institute of Health showed that 27.7 in every 1,000 women workers 15 to 64 years old visited, compared to 22 per 1,000 men, were ill on the day of the canvass.

In 1940, the Public Health Service reports, 101 out of every 1,000 women industrial workers, but only 65 out of every 1,000 men, had an illness of 15 days or longer.

A Public Health Service report on a large public-utility company shows absences of one day or longer due to sickness and accidents averaging per year 900 for every 1,000 men and 1,820 for every 1,000 women. (This also may indicate a higher turnover of women.)

So far as industrial injuries are concerned, these are more severe for men than for women: but the total of time lost in the year because of illness is greater per 1,000 women than per 1,000 men.

The Public Health Service report referred to above shows that in a year's time the woman worker loses an average of 10.9 days, the man an average of 7.5 days, because of illness or injury.

Records from the same public-utility company for an earlier period showed the average annual days of disability per person on the payroll were 6.5 for men and 13.1 for women.

There is little difference between men and women workers in the number of non-industrial injuries suffered in the year.

For the years 1935-39, the Public Health Service reports 11 cases of non-industrial injuries in every 1,000 women industrial workers, and 13 cases in every 1,000 men.

There is a large body of experience to show how absenteeism is greatly reduced by measures that prevent excessive fatigue, such as shortened hours, rest pauses on exacting work, guarding against too great a speed-up, and so forth. Fatigue not only predisposes the worker to illness but causes greater proneness to accident and in both these ways absenteeism is increased.

The following examples indicate that absenteeism can be reduced markedly by a shortening of work hours and by planned rest pauses. Plant facilities for a hot nutritious meal also help to alleviate fatigue and maintain health, and thus to reduce absenteeism.

In a Women's Bureau study of lost time in cotton mills, the proportion of time lost by women was twice as great in 55-hour mills as in those with a 48-hour schedule.

Reduction of hours to eight a day markedly reduced absenteeism in plants surveyed by the Federated American Engineering Societies after World War I.

An Indiana plant that kept careful records of absenteeism showed that girls who worked long overtime were so fatigued that more hours were lost through absenteeism than were added by overtime.

Records reported for a cotton plant show a reduction in sickness after the introducing of rest periods in forenoon and afternoon.

British experience found twice as much time lost by men and women who worked long hours as by those with shorter hours. In three shell factories, after the week was shortened to 44 hours lost time from sickness was reduced. After the change men lost no time, women 3% of their time, though formerly both had lost about 6% or more.

Proneness to accident was found in a British munitions plant to be two and one-half times as frequent in a 12-hour day as in a 10-hour day. No doubt further reduction of hours would reduce accidents still more than this.

British experience in the present war has been marked by the serious problem of absenteeism, in some industries as high as 20 or 25%. Contributing to this condition were the excessive work hours (since shortened), the influenza epidemic reaching its peak in the winter of 1940, and the disruption of transportation and other living facilities by air raids.

In British factories where both men and women were employed, women lost on the average about twice as much time as men. However, a major munitions firm reported that certified illness had increased for men but not for women. (Younger men were called to the armed forces, and the men remaining were older or "of low medical grade.") Where the five-day week formerly had been the custom, Saturday absences constituted nearly half of all in the week (for both men and women).

An important cause of absenteeism among women, besides illness, is in their household duties. This is a factor that will have to be met by adjustments in industry, as long as women workers are expected also to give service to their families or to perform personal services for themselves that are not expected of working men.

In England, where need for woman labor is acute, measures taken by industry to meet this situation include arrangement of shifts so that women will have time to buy and prepare food for their families, arranging that women's leave time can be granted when their men are on leave from the armies, and the organization of some industries so as to use considerable part-time work.

A major British munitions firm has

From "Equal Pay for Women in War Industries," Bull. 196 of the Women's Bureau, Washington, D. C.

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[1]PICKRELL, K. L.: Bull. Johns Hopkins Hosp. 69:217 (Aug.) 1941.
[2]ADAMS, W. M., and CRAWFORD, J. K.: South. Surgeon 11:324 (May) 1942.
[3]HAMILTON, J. E.: Kentucky M. J. 40:207 (June) 1942.
[4]STEIGMAN, A. J.: Lancet 1:632 (May 23) 1942.
[5]HAYDEN, R.: J. M. Soc., County of New York, 1:6 (July 25) 1942.

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reported that absence due to illness among part-time women employees is only 1.8%, though it runs to 3.3 among married women who are on full-time work.

Industrial Nursing Personnel
—Essential for Maximum War Effort—

MAINTAINING good health and mental stability among industrial workers is fundamental to winning the war, and professional nurses are essential to effective health and safety programs. Adequate service to the armed forces is creating a shortage of nurses. In view of this shortage it becomes necessary for industry as well as hospitals and community health agencies to employ graduate nurses for functions that they alone can perform, and to delegate to trained helpers clerical details and first aid procedures which can be performed by them under supervision of a physician or a nurse.

The number of nurses necessary for a particular industry will be determined by the number of workers and the hazards of the industry. Two hours of nursing time a week for each unit of 100 employees is considered by the National Association of Manufacturers to be the minimum necessary to provide essential nursing service.

Prepared by the Executive Committee, Industrial Nursing Section of the National Organization for Public Health Nursing.

Where workers are divided into two or three shifts the number of nurses per unit of workers on each shift, rather than the total, must be considered.

Large industries may supplement the work of graduate nurses by employing both men and women assistants for doing first aid in the central dispensary as well as in the first aid stations throughout the plant when such stations are maintained. These workers should be given both standard and advanced Red Cross first aid courses and such supplementary training by nurse or physician, or by both together, as may be indicated by the needs of the particular industry. They should be supervised regularly and frequently by a graduate nurse. A study should be made of the service being rendered in all first aid stations of large plants to determine where one nurse to an area might supervise assistants in carrying on work now being done by several nurses.

Responsibility of graduate nurses in industry falls most heavily upon the nurse in plants of from a few hundred to two or three thousand employees, where there is only a part-time physician or a physician on call, and where neither safety engineers nor welfare workers are employed. The current shortage of physicians is being felt particularly in these plants, and nursing activities are being increased here as elsewhere by the rapid labor turnover, employment of less physically fit workers, women and youths. In view of the general shortage of graduate nurses, women trained as nurse assistants and clerical helpers may be employed to help carry the increased load, working under supervision of the registered nurse or nurses already employed, rather than the number of graduate nurses be increased in these industries.

Small plants may combine to employ one nurse who serves part time in each, or may purchase part-time nursing service from the local public health nursing agencies. These are plants that usually have little or no health service, but that greatly need it.

The Study of the Duties of Nurses in Industry, sponsored by the Public Health Nursing Section of the American Public Health Association, from which data were secured in 720 plants employing 2,370 nurses, provides a means for determining the scope of industrial nursing as it is being practiced today. The duties performed by the nurses in the industries included in the survey have been classified under eight major divisions, as shown in Column A of the attached table. Because the activities and responsibilities of industrial nurses vary according to the size of the plant and organization of the health service, the suggestions offered in the table for

the conservation of the nurse's time are broken down into three categories, and listed in columns B, C and D. Essential nursing services are indicated by N. Services for which the nurse assumes responsibility but which could be performed by auxiliary workers under the direction are indicated by N-Aux.

A	B	C	D
ACTIVITIES IN WHICH INDUSTRIAL NURSES ENGAGE. As determined by data accumulated from 720 plants.	Large plants with full-time physician, safety department, social service or welfare department.	Smaller plants with part-time physician or physician on call, one or more full-time nurses, no safety engineer, no welfare department.	Small plants with physician on call and using the divided service of one nurse or hourly VNA service.
I. NURSING TREATMENT AND CARE OF OCCUPATIONAL INJURIES AND ILLNESS; EMERGENCY TREATMENT OF NON-OCCUPATIONAL ILLNESS.			
1. Assisting physicians with care of injured and ill workers.	N-Aux.	N-Aux.	N-Aux.
2. Caring for workers who do not need attention of physician.	N-Aux.	N-Aux.	N-Aux.
3. Referring workers with occupational illness or illness or accidents to outside physician.	M.D.	N-Aux. (through M.D. on call)	Same as C
4. Referring workers suffering from non-occupational illness to family physician.	M.D.	N	N
5. Training first aid assistants.	Authorized first aid instructors and N or M.D.	Authorized first aid instructors and N or M.D.	Same as C
6. Supervising first aid workers.	M.D. or N	N	N
7. Maintaining adequate injury and illness records.	Clerical staff under M.D. or N supervision.	N-Aux.	N-Aux.
II. ASSISTANCE WITH THE ACCIDENT CONTROL AND SAFETY EDUCATION PROGRAM.			
1. Interview injured worker and record information relative to accident.	N or clerk under supervision of M.D.	N-Aux.	N-Aux.
2. Instructing injured workers on safety practices at time treatments are given.	N-Aux.	N-Aux.	N-Aux.
3. Planning safety programs.	Safety department	N in cooperation with foreman and other employees.	Same as C
4. Assisting with accident investigation.	Safety department	N in cooperation with foreman and other employees.	Same as C
5. Making recommendations for control measures.	Safety department	N and safety committee	Same as C
6. Organizing safety committee and participation in its activities.	Safety department	N participates definitely but does not organize.	Same as C
7. Issuing and maintaining personal protective equipment.	Safety department	N-Aux.	N-Aux.
8. Maintaining bulletin board.	Safety department	N-Aux.	N-Aux.
9. Arranging safety education meetings.	Safety department	N	N
10. Assisting with plant disaster activities.	Safety department	N-Aux.	N-Aux.
III. MAINTENANCE OF THE PLANT MEDICAL DEPARTMENT.			
1. Ordering and arranging necessary supplies and equipment.	N-Aux.	N-Aux.	N-Aux.
2. Scheduling workers for examination and re-treatments.	Secretary	N-Aux.	N-Aux.
3. Completing and filing records.	Secretary	N-Aux. (except records of confidential nature).	N-Aux.
4. Representing the medical department in any inter-departmental planning and discussion.	M.D.	N in absence of M.D.	Same as C N in absence of M.D.
5. Responsibility for integrating the medical services with other plant services.	M.D.	N	N
6. Analyzing or assisting with analysis of medical department records.	M.D. and N.	N	N
7. Preparing medical department reports.	M.D. or N with clerical help	N with clerical help	N with clerical help
IV. PARTICIPATION IN THE MEDICAL EXAMINATION PROGRAM.			
1. Taking personal and occupational history.	N-Aux.	N-Aux.	N-Aux.
2. Explaining to worker value of examination and procedure to be followed.	N	N	N
3. Making vision and hearing acuity tests.	N-Aux.	N-Aux.	N-Aux.
4. Taking specimens for serological and other laboratory tests.	Technicians	N	N
5. Making blood pressure readings.	M.D. or N	N-Aux.	N-Aux.
6. Making x-ray plates.	Technician	Technician	Technician
7. Chaperoning women workers.	N-Aux.	N-Aux.	N-Aux.
8. Maintaining adequate health records.	N-Aux.	N-Aux.	N-Aux.
V. PARTICIPATION IN THE HEALTH EDUCATION PROGRAM.			
1. Counseling with individual workers concerning personal health problems.	M.D. or N	N	N
2. Supplementing health instruction given by the physician.	N	N	N
3. Giving planned health supervision of workers with remediable or chronic conditions.	N	N	N
4. Teaching standard or advanced first aid classes.	To be delegated to authorized first aid instructors.	Same as B	Same as B
5. Posting health materials on bulletin board.	N-Aux.	N-Aux.	N-Aux.
6. Teaching nutrition.	Community nutritionist or N	Same as B	Same as B
7. Writing articles on health for plant publication.	M.D.	N	N
8. Keeping sickness absentee records.	N-Aux. with clerical help	Same as B	Same as B
VI. ASSISTING WITH ENVIRONMENTAL SANITATION.			
1. Assisting with sanitary inspection of women's facilities.	N directing matron	N directing assistant	Same as C
2. Inspecting lunchroom.	N-Aux.	N-Aux.	N-Aux.
3. Selecting matron for women's facilities.	Personnel department	Personnel department	Personnel department
4. Training and supervising matrons.	Head matron	N	N
5. Assisting with plant housekeeping.	Safety department	N-Aux.	N-Aux.
VII. PARTICIPATION IN PLANT WELFARE PROGRAM.			
1. Counseling with individual workers regarding personal social problems.	Social service dep't or welfare counselors.	N	N
2. Assisting with recreation program.	Not a nursing function. Personnel department.	Same as B	Same as B
3. Assisting with group sick benefit activities.	Personnel department	N-Aux.	N-Aux.
4. Assisting with group hosiptalization activities.	Personnel department	N-Aux.	N-Aux.
VIII. SERVICES TO ILL OR INJURED WORKERS IN THEIR HOMES.			
1. Home visiting to give nursing care and health supervision.	N or delegated to local VNA where there is one.	Same as B	Same as B
2. Assisting workers with social problems in home.	Social service dep't cooperating with community agencies.	N cooperating with community agencies.	Same as C
3. Determining cause of absence.	Not a nursing function. Personnel department	Same as B	Same as B

Note: Essential nursing services are indicated by N. Services for which nurse assumes responsibility but which could be performed by auxiliary workers under her direction are indicated by N-Aux.

The Company Rule Book

—As an Opportunity for Health and Safety Education—

W. I. NEWMAN, Personnel Director, Manning, Maxwell & Moore, Inc., Bridgeport, in *Connecticut Industry*, November, 1942, describes his company's current "Employee Manual." His comments are included here in order to emphasize the fact that every such manual, or rule book, furnishes an excellent opportunity for the health and safety education of employees — an opportunity, however, which in the majority of employment situations has been completely overlooked. Most manuals of the kind are little more than revised carry-overs from the long-ago days preceding industrial medicine, and, of course, industrial psychology. It may well be suggested that all such be rewritten; and that, in the rewriting, a leaf or two, as it were, be taken from the following:

Too often the normal worker's reaction to the usual type of company "rule book" is, "Aw hell, do they expect me to read all that tripe?"—and to drop it into the nearest waste can.

There are several rather good reasons for such unfavorable reception to the older type of "rule book." First, they usually are written in a dictatorial manner by someone whose writing vocabulary is limited to a dozen such terms as "Don't," "Forbidden," "Prohibited," "severe penalty" and others equally irritating.

Again, and too often, they are written in front-office language, instead of in the language of the shop. In the shop, when a man befouls the floor, we call it "spitting," a good old English word. Nothing is gained by trying to euphonize it by front-office dressing. Similarly, "Cans are provided for waste paper. Please use them" gets more attention and less resentment than the customary "Don't throw refuse on the floors." The decent workers' reaction to such "don'ts" is—"What the hell do they take me for —a pig?"

Again, induction books in their physical makeup are often just about as attractive and interesting as a timetable when one is not going anywhere. Dull, lifeless, monotonous pages meet the eye of the worker who is expected to read them. Certainly if an induction book is to do the job it should do, which is that of helping to get the new employee started in his work as soon as possible, it must be read. The only assurance that it will be read is to make it lively, interesting, helpful, of some intrinsic value, and above all, human.

Such a book, we believe, is our new induction manual "Your Job With Manning, Maxwell & Moore," recently distributed to our 2500 employees, two-thirds of whom are recent acquisitions quite unfamiliar with our ways.

It is written in shop language by men who are still in the shop. Every page is illustrated by lively cuts that fit the text; these and the use of color give life to its pages. Its style, if it has any, is kindly, tolerant and human. The admonition "don't" appears only when no other word would answer. It is written *for* the worker and not *at* him. It is a fine example of the printer's and illustrator's arts and is therefore expensive, hence it has intrinsic value not often found in such books.

In brief the manual is intended to convey to the worker that it was prepared primarily for his benefit and only indirectly for that of the company.

As an inducement to the worker to keep and preserve the book it has a number of blank ruled pages intended to serve him as a note book in which he may record the high-lights of his employment history with us. Spaces for social security number, draft registration and status, and other personal items are provided.

If the "rule book" that you are now using is dull and drab and too often winds up in the refuse cans, maybe it needs overhauling to match up with today's requirements. If it costs you a dime a copy — and looks it — try spending 50 cents and see what happens. It's the same idea that is involved when you give a friend one of your 50-cent Corona Coronas when the most he expected was a 10-center. He rather appreciates it.

Following is the "Health and Safety" section of the Manual:

Plant Safety Committee

MANNING, MAXWELL & MOORE, INC., strives constantly to prevent accidents and to eliminate health hazards by every available means, including systematic safety devices, guards, and first aid and medical services.

All matters pertaining to safety are handled by a thoroughly experienced Plant Safety Committee, consisting of foremen, supervisors and factory workers. Suggestions may be referred to this committee, in care of the Personnel Department.

First-Aid Facilities

A FULLY-EQUIPPED hospital, under the direction of competent nurses, is maintained for your use and convenience. If you are injured, no matter how slightly, advise your foreman and report to the hospital at once. Failure to do so may jeopardize your chances of obtaining compensation should infection set in. Having reported to the Plant Nurse you will be under her instructions as to further treatment until discharged. Competent medical attention by industrial physicians and specialists is provided in all instances of compensable injury. Cases of sickness or indisposition, occurring during working hours may also be referred to the Plant Nurse for whatever assistance or relief she may be able to provide. The Plant Hospital is located on the first floor adjoining the Personnel Department. A first aid kit is maintained at the gate house for injuries that may occur on night shifts.

Safety Rules

USE EVERY precaution to guard your own safety and that of others. Keep off elevators and fire-escapes unless your duties require you to use them. Do not, under any circumstances, attempt to use a band-saw, rip-saw, or any other wood-working machinery unless your work involves their use. Use goggles or safety glasses when working on emery wheels, machines that throw chips, or when using an air-hose for cleaning purposes. Our tool-cribs have a supply of goggles and glasses and they are available to every worker. Keep the space near your machine or bench clear of obstructions that might cause you or others to trip and fall. Report any safety hazard to your foreman at once. An award of $1.00 is paid for all safety suggestions accepted and adopted by the Safety Committee. Women workers, whose duties require them to work on or near machines or shafting, should wear suitable hair nets to confine their hair so it cannot be caught in the revolving machinery. Such nets are furnished free by the Company and may be obtained from the Personnel Department. Male employees, whose work involves any sort of foot hazard such as handling of heavy boxes or castings, are urged to wear safety shoes to avoid foot injuries. Such shoes are available locally at the Thom McAn Shoe Store. In departments where foot hazards exist the Company will bear one-fourth of the expense of safety shoes.

Fire Hazard

SMOKING is absolutely prohibited in any part of the plant except those places set apart for the purpose. Smoking is permitted in the factory toilets, in the Foundry, Heat Treating Department, Boiler Room, and in private offices. If you are in doubt as to whether you may smoke or not, ask your foreman. Many of the materials used in the manufacture of our products are of combustible nature, such as oils, lacquers, paints, etc. Be sure you know how to handle them to avoid the danger of fire. Report to your foreman any condition that you think constitutes a fire hazard. Inform yourself as to the location of fire escapes, fire alarm boxes, fire extinguishers and other fire-fighting equipment, so you may render useful service if a fire should break out.

Know the location of the nearest exit you would use in case fire broke out and it became necessary to empty the building quickly and in an orderly manner. Your foreman will instruct you about this. If he does not do so, be sure to ask him.

Keep It Clean

DURING the past year more thought, labor, and expense have been expended on plant cleanliness than at any other period of our plant history.

Cleanliness and orderliness are of

vital importance to our business success. They are the first rules of quality production and our customers insist on quality. Therefore, you will be expected and required to do your share toward keeping the plant clean.

Regular cleanliness inspections are made, and ratings are given to each department, according to the conditions that are found. You can help your department to get an A rating by keeping your job clean. You can also help to maintain sanitary conditions by avoiding the habit of spitting on the floors, stairs, or in hallways. Such a practice is unsanitary, unsightly, and absolutely unnecessary. *Use the cuspidors.* Containers are provided for the disposal of waste and refuse. *Use them.* If your work involves the use of cutting oils and compounds, which might carry contamination to another worker, keep them clean—above all, don't spit in them.

Workmen's Accident Compensation

EMPLOYEES will receive compensation for time lost due to injuries arising out of their work in accordance with the terms of the Connecticut Workmen's Compensation Act.

The Compensation Act provides that a worker shall be paid for the remainder of the day on which the accident occurred.

If the disability lasts more than seven days, not counting the day of the injury, compensation amounting to one-half pay up to $25.00 weekly is paid, commencing with the second week of disability. If the disability lasts more than 28 days the first week of disability is compensable also.

In the case of hernia the law specifies that report must be made within two weeks, inability to work must follow within one week, and there must be a clear history of every injury.

To be on the safe side you should report at the Plant Hospital AT ONCE, if you are injured.

Oral Manifestations

"ORAL Manifestations of Occupational Origin" is the title of an interesting and instructive article (in *J.A.M.A.*, December 12, 1942) by ISAAC SCHOUR, D.D.S., PH.D., and BERNARD G. SARNAT, M.D. The purpose of the authors is to present a summary and analysis of the available information on oral occupational disease. Their paper was presented at the Fourth Annual Congress on Industrial Health in Chicago a year ago; and they acknowledge the encouragement of DR. M. H. KRONENBERG and DR. CARL M. PETERSON in making their study. The analysis and comments are interesting, instructive, and—at this time when nothing whatsoever should be left undone that will

Oral Manifestations of Occupational Disease According to the Etiologic Agent

Etiologic Agent				
Physical State	Principal Action	Specific Factor	Occupation	Possible Oral Manifestations
Solid	Physical	Instruments for prehension	Cobblers, carpenters, glass blowers, musicians (wind instruments), seamstresses	Localized abrasion
	Chemical	Tar	Fishermen, asphalt and coal tar workers, pavers, pitch roofers, wood preservers	Stomatitis, carcinoma of lip and mucosa
Dust	Physical	Inorganic: Copper, iron, nickel, chromium, coal, etc.	Bronzers, cement workers, electrotypers, grinders (metal), miners, stone cutters	Staining of teeth, pigmentation of gingivae, generalized abrasion, calculus, gingivostomatitis, hemorrhage
		Organic: Bone, celluloid, sawdust, flour, tobacco	Bone, celluloid, flour, sawmill, textile and tobacco workers	Staining of teeth, pigmentation of gingivae, generalized abrasion, calculus, gingivostomatitis, hemorrhage
	Chemical	Inorganic: Arsenic	Chemical workers, electroplaters, metal refiners, rubber mixers, lead smelters, insecticide makers	Necrosis of bone
		Bismuth	Bismuth handlers, dusting powder makers	Blue pigmentation of gingivae, oral mucosa, gingivostomatitis
		Chromium	Aniline compound, chrome, photographic and steel workers, blue printers and rubber mixers	Necrosis of bone, ulceration of oral tissues
		Fluorine	Cryolite workers	Osteosclerosis
		Lead	Electrotypers, insecticide and storage battery makers, lead refiners, printers, rubber compounders	Blue-black pigmentation of gingivae, gingivostomatitis
		Mercury	Bronzers (gun barrels), battery and paint makers, dentists, detonators, explosive and mercury salts workers	Gingivostomatitis, osteomyelitis, ptyalism
		Phosphorus (white, yellow)	Brass founders, match factory, phosphor bronze workers, fertilizer and fireworks makers	Gingivostomatitis, ulceration of oral tissues, osteomyelitis
		Organic: Sugar	Refiners, bakers, candy makers	Caries
Liquid	Physical	Hot food (coffee, tea, soup)	Tasters	Stomatitis, leukoplakia
	Chemical	Aniline	Aniline, coal tar, explosive workers, painters, tannery workers, vulcanizers	Blue coloration of lips and gingivae
		Benzene	Coke oven and lacquer workers, dry cleaners, vulcanizers, smokeless powder makers	Hemorrhage from gingivae, stomatitis, blue coloration of lips
		Cresol	Coal tar, rubber, tar, distillery and surgical dressing workers, disinfectant makers	Stomatitis
		Wine and liquor	Tasters	Anesthesia and paresthesia of tongue
Gas	Physical	Atmosphere: Increased pressure	Divers, caisson workers	Bleeding from gingivae
		Decreased pressure	Aviators	Bleeding from gingivae
	Chemical	Acids: H_2SO_4, HNO_3, HCl, HF	Acid and cartridge dippers, petroleum refiners, explosive and gun cotton workers, galvanizers	Bleeding, stomatitis, decalcification of enamel and dentin
		Amyl acetate	Alcohol, distillery, explosive, shellac, smokeless powder and shoe factory workers	Stomatitis
		Acrolein	Bone grinders, lard, soap, linoleum makers, varnish boilers	Stomatitis
		SO_2, NH_3, BR, Cl_2	Acetylene, dye, photographic film, phosgene makers, sugar refiners, refrigerating plant, disinfectant, laundry workers	Stomatitis
		CO, CO_2	Miners, smelters, gasoline motor workers	Coloration of lips (cherry red, blue)
Ray	Physico-chemical	Radium, x-ray	Technicians, watch dial painters, research men	Gingivitis, periodontitis, osteomyelitis and necrosis, xerostomia, osteosclerosis
		Actinic	Sailors, fishermen	Carcinoma of lip

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by

Joseph L. Fetterman, M.A., M.D.
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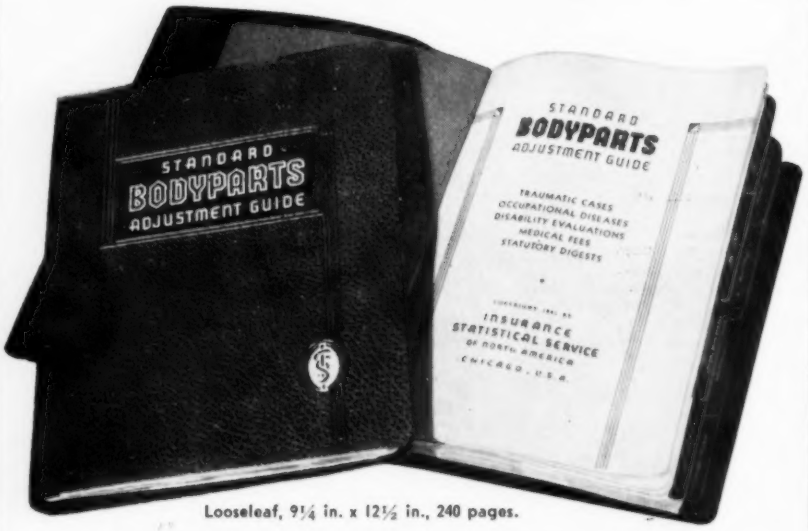

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head off and prevent industrial ill health—exceedingly important. The article will repay a careful reading. One of the tabular presentations and the authors' conclusions are as follows:

THE problem of oral manifestations of occupational origin must be considered according to the pathologic process, structure affected, etiologic agent and occupational distribution.

2. The oral cavity is a chief port of entry for occupational noxious agents. All medical examinations of industrial workers should therefore include an oral examination.

3. In the study of occupational disease an examination of the oral cavity offers the following advantages: (a) The oral cavity is easily accessible. (b) Local effects are readily recorded in exposed enamel and dentin and in the soft structures. The record in the enamel and dentin is often permanent and may reveal past occupational exposures. (c) Systemic effects may be transmitted in the oral cavity through the blood stream and the saliva and are often manifested in characteristic symptoms.

4. Poor oral hygiene renders the worker more susceptible to oral occupational hazards. These hazards are minimized in the presence of oral health. Oral hygiene is an essential part of industrial hygiene.

5. Adequate provisions for industrial health should include the prevention, the early recognition and the treatment of oral occupational diseases. The problem of reducing oral occupational diseases should, therefore, be met by (a) improving working conditions and (b) establishing and maintaining optimal oral and general health.

6. Further studies of oral occupational disease should be conducted in order to check or confirm previous reports and to discover possible manifestations arising in new industries.

Continued from page 44—

hospital if they sustain even a scratch or minor injury. Employees are given periodic physical examinations, and the hospital facilities are available for the treatment of minor non-occupational illnesses.

EFFICIENCY will suffer if workers are asked to carry on in factories, offices, etc., which are cold. Nor can one heat places of work adequately and have private homes cold, for the worker will, therefore, not have a place for relaxation or recreation. Instead of working or resting at proper intervals, the people will be spending their time trying to keep warm. It is well known that cold tends to produce a depressed frame of mind with lethargy and apathy. Adequate heating may thus become essential to maintain efficiency and cheerfulness.

—LOUIS MINSKI, M.D., in Lippincott's *Digest of Treatment*, December.

INDUSTRIAL HYGIENE SECTION

This Industrial Hygiene Section is published to promote sound thought upon and concerning industrial hygiene. To that end it will contain articles, discussions, news items, reports, digests, and other presentations, together with editorial comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

Reg. U. S. Pat. Off.

The Editorial Committee will exercise its best judgment in selecting for publication the material which presents most exactly the factors affecting industrial health and developments for control of potentially injurious exposures. The editors may not concur in opinions expressed by the authors but will endeavor to assure authenticity of fact.

The Science, the Law and the Economics of Industrial Health

Volume 4 | January, 1943 | Section 1

Hindering Hysteria

WITH many workers being engaged in industry for the first time and others in occupations with which they have not previously been familiar, there tends to be a feeling of over-apprehensiveness in regard to the new surroundings. In no phase of the new environment under which men and women find themselves is this more true than in regard to occupational disease exposures. Already in one large industry of great importance to the war effort a group of workers became so apprehensive over the possibility of injury to health due to materials necessary to the process that cessation of work was threatened.

In the past there have been a number of instances where hysteria has developed due to over-magnification of health hazards concerning which both the industry and the workers were not adequately informed. Among the circumstances which occasioned distorted viewpoints, owing to lack of accurate information over the past decade or two, may be mentioned excessive exposures to lead tetraethyl in its manufacture, benzol as used in the artificial leather industry, and silica dust in a much publicized tunneling operation.

It is well recognized that nerves become frayed under the pressure of war conditions. If we are to avoid hysteria among groups of people thrown into new occupation environments where they may smell obnoxious odors, see puffs of dust, or feel the irritation of caustic mist or gas on the eyes and nose, it is going to be necessary not only to keep exposures of such materials within safe limits but also to have specific knowledge as far as possible that such exposures are causing no injury to health.

Today there are a considerable number of services available through Federal, state and municipal bureaus, through insurance companies and through organizations and private consultants to provide just such information. Where industries are of sufficient size and present appreciable exposures, they should include, and to an increasing extent are including, trained industrial hygiene personnel.

By obtaining specific information on exposures to potentially injurious materials we have a potent means for preventing development of hysteria. In the first place adequate control as indicated by data on the extent of the exposure will go far in avoiding the development of cases of occupational disease; and in the second place the knowledge among employees that there is specific data showing conditions to be safe will be effective in reducing apprehension over the new surroundings.

There is no greater deterrent to efficient activity than an hysterical attitude toward the environment in which people find themselves. Employers should make ample provision that, so far as potential health hazards are concerned, they take adequate measures to avoid the possibility of development of hysteria due to such causes within their plants.

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Donald E. Cummings

"God's Soldier Be He!"

AN AP dispatch from Fairfield, Utah, December 16, 1942, describing a Western Airlines transport crash that killed 17, continued: "....the victims.....DONALD E. CUMMINGS, 42, of Denver, head of the Industrial Hygiene Department of the University of Colorado."

Thus died an Officer of our Army of Production, who, except for others of the inscrutable ways of Providence, would now have been an Officer of our Army of War.

It was not generally known, even among the legion of his friends, that DON CUMMINGS was a West Point graduate, though his soldierly bearing bespoke the background. It was, however, universally known throughout his thousands of acquaintances that he was one of the really important men among the leaders in the science and the practice of industrial hygiene.

He was born at Blue Earth, Minnesota, in 1900. Completing high school there, he spent a year at a school in Alabama, preparatory for West Point. He was graduated from the U. S. Military Academy at West Point in 1920, as a Lieutenant. After about a year in the army, at Fort Knox, Kentucky, he resigned his commission to attend Massachusetts Institute of Technology, whence he emerged in 1923 with the degree of B.S. in chemical engineering. He continued in residence at M.I.T. as a member of the faculty during the succeeding summer course under Dr. Warren A. Lewis.

It was at this time that the condition developed which required him to go to the Trudeau Sanatorium at Saranac Lake, New York, where he was a patient for about a year before the condition became arrested. When he could be about, he taught physics and chemistry in the high school at Saranac Lake. Two years of this found him in better health, and he was able to take first-hand interest in the activities of the Saranac Laboratory for the Study of Tuberculosis, where Dr. LeRoy U. Gardner, its Director, was conducting experimental work on the effects of dust inhalation in connection with tuberculosis. In 1928 he became associated with Dr. Gardner in research on pneumoconiosis. Later he was made Assistant Director of the Laboratory, and throughout the remainder of his too short career he continued in this identification.

Characteristically, when he began to appreciate the diversity of Dr. Gardner's experimental work and the complexities involved in the results that were being sought, he made up his mind to become so familiar with every phase and feature of the whole business that he could not only understand what it was all about, but could also do every part of it himself. It is a matter of record, at least in Dr. Gardner's recognition, that he did just that. During the next half-dozen years he dug into all phases of the experimental work connected with silicosis and the interrelation between dust exposure and the development of tuberculosis. In the laboratory he developed a method for the separation of particulate matter smaller than screen sizes into graded fractions; this was incidental to the experiments being conducted, under Dr. Gardner's direction, on experimental pneumoconiosis. In the published reports of the laboratory studies he collaborated with Dr. Gardner in what is still the standard paper on the effect of inhalation of asbestos dusts upon primary tuberculous infection.

Recognition of his ability and the qualities of mind and heart that he put into his work brought him a series of assignments of progressive importance. The first one followed the closed conference on dust exposures held in Chicago in the autumn of 1932 under the auspices of the Wisconsin Industrial Commission. This assignment involved an investigation of the dust exposures in the mining operations of a large company in northern Wisconsin, to ascertain the extent of the dust hazards and develop methods of silicosis prevention. He moved into the mine area and, for the several months which the work required, he spent a great deal of his time underground, mastering every detail of the work. The result was that he installed a ventilation program which is still as well liked by all concerned—executives, medical men, superintendents and workers—as it was well received by all of them when it was first put in.

From this job he was called to others, mostly in mining; and gradually he begun to feel that he knew something about the prevention of silicosis. At a meeting of the Lake Superior Iron Ore Association in 1933, he presented the advantages of a comprehensive program for silicosis prevention, and did it so well that he was prevailed upon to become Director of the Saranac Field Service in charge of the work in the Lake Superior region, where he resided at Ironwood, Michigan, through 1934 and 1935. His vivid approach to the whole problem of silicosis is well illustrated by his discussion of the administrative aspects, at the third Saranac Lake symposium.

Dust is only one hazard, and in studying it he became familiar with others. Each was a challenge, and he made it his business to learn everything there was to be known about them and the means of their prevention and control. His mind could not suspend inquiring as to any of them until the last question was answered as to all of them. And so thorough were his studies that he became an authority on many matters of occupational health significance. As an ex-

ample, he got to know manganese poisoning as well as he knew silicosis—and that meant he knew it very well indeed. From his often demonstrated ability to talk to physicians in their own language on the medical and x-ray evidences of silicosis, he went rapidly to an ability of conviction on employee health in general, to which he gave voice among presidents and board of directors. And, naturally enough, he was soon occupied in organizing occupational disease control and industrial health programs for manufacturing as well as mining industries; the transition from extracting ore to handling metal meant progress from hazards of one kind to those of another kind. Among the next of his important assignments was the engagement to install an occupational disease control and employee health program for one of the large steel companies in the Chicago area. In this behalf he was consultant; and almost immediately thereafter his reputation as a consultant had become national—and, more, continental.

Too much of his brain and body, however, were going into his work; in 1936 his tuberculous condition became activated, and he moved to Denver to recuperate. For a year or so then, his bedside was piled high with letters and documents relating to his consultations and the direction of projects begun under his charge.

Once again able to go about, he resumed his consulting work on an ever-expanding scale, particularly among the large mining concerns in the Rocky Mountain area. In 1938 he organized an industrial hygiene course and was appointed Director of the Department of Industrial Hygiene of the Medical School of the University of Colorado. At Dr. Gardner's request, he continued as Director of the Saranac Field Service, but limited his interest in this regard largely to the work with the Lake Superior Iron Ore Association.

He was active in the organization of the four Saranac Lake symposiums on silicosis in 1934, '35, '37, '39 and presented papers at each. At the 1941 Saranac symposium on tuberculosis in industry he discussed the subject so comprehensively that his analysis was published by the International Labor Office in their work, "Occupation and Health."

At the time of his death he was using the method of travel so frequently necessary for him over the past years; the operations he was directing were widely scattered. He had been consulted on the possibility of excessive exposure to manganese ore dust in the huge mining operations in the vicinity of Las Vegas, Nevada; he was engaged in setting up an engineering and medical program so that this development, extremely important in the present war effort, would not be set back by occupational diseases among the workers.

One of the pioneers in the organization of the American Industrial Hygiene Association, he was made president-elect in 1940 and succeeded to the presidency the following year. In his consulting capacity he was connected with the U. S. Public Health Service under Dr. Leake. His memberships included the National Tuberculosis Association, and the American Chemical Society; he was also among the members of a special committee of the American Society for Testing Materials.

Although not a prolific writer, his dozen or so of published papers are notable for thoroughness of concept and studiousness of preparation.

He is survived by his widow, Helen Clark Cummings, a daughter Cynthia, 14, and a son John, 12.

He was taken from the midst of his work, but his place in the history and development of industrial hygiene is nevertheless as prominent and secure as if he had been longer spared. The future could have added only more, not brighter, luster. Carrying on in spite of handicaps that would have floored a lesser man, he made the best of all his qualities and abilities; every one of the multitude who will miss him and long remember will agree that "best" for him meant only *superlative*. Honest, forthright, kindly, he was preeminent in the place he had made for himself—a good soldier, in the uniform of his own fine capabilities.

Lead Symposium

—Journal of Industrial Hygiene and Toxicology, February, 1943—

A NOTABLE feature of the meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS and the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION held at Cincinnati in April, 1942, was the symposium on lead poisoning. In addition to the usual abstracts, the February, 1943, issue of the *Journal of Industrial Hygiene and Toxiology* will contain all six of the papers presented at this symposium. No other articles will be published in this issue. The editors believe this symposium will make an important monograph, and they request that anyone interested in securing a copy of the February issue (Vol. 25, No. 2, February, 1943) write in advance to Williams and Wilkins, Inc., Mt. Royal and Guilford Avenues., Baltimore, Maryland. The price will be the usual cost of the current issues of the *Journal*, namely 75 cents, postpaid.

The papers and authors are as follows:

"The Measurement of Industrial Lead Exposures by Air Analysis," by JOHN BUXELL, Health Division of the Department of Public Welfare, of the City of St. Louis.

"Measurement of Industrial Lead Exposure by Determination of Stippling of the Erythrocytes," by LESTER W. SANDERS, Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati.

"Measurement of Industrial Lead Exposure by Analysis of Blood and Excreta of Workmen," by JACOB CHOLAK and KARL BAMBACH, Kettering Laboratory, University of Cincinnati.

"Industrial Lead Poisoning as a Clinical Syndrome," by WILLIAM F. ASHE, Kettering Laboratory, University of Cincinnati.

"Health of Lead-exposed Storage Battery Workers," by W. C. DREESSEN, U. S. Public Health Service.

"Experimental Studies on Lead Absorption and Excretion and their Relation to the Diagnosis and Treatment of Lead Poisoning," by ROBERT A. KEHOE, JACOB CHOLAK, DONALD M. HUBBARD, KARL BAMBACH and ROBERT R. MCNARY, Kettering Laboratory, University of Cincinnati.

Acute and Chronic Toxicity

—Public Health Aspects—

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AS OUR population becomes more urban and our consumption of synthetic materials grows with each year, the problem of acute and chronic toxicity becomes increasingly important to the public health. Such concentration of population necessitates handling, transportation, and storage of foodstuffs. This in turn has resulted in the use of preservatives and stabilizers, and in the danger of contamination of foods in manufacturing, refining, and packaging. The exposure of the

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majority of the population to ever-increasing quantities of synthetic products in foods, drugs, cosmetics, household items, clothing, etc., extends the possibility of chemical sensitizations and poisonings. Urban areas require central water supplies which must be so chosen and maintained that they will not contain harmful impurities. The exposure of hundreds of thousands of industrial workers to toxic substances is another important factor in the public health. This is especially true in the present emergency. There is the danger that the industrial hazards of rapidly developing new processes and longer hours of exposure have not yet been fully appreciated. In addition, the spraying of fruits and vegetables for insect control has given rise to the spray residue problem. These are some of the problems that face public health officials in a modern civilization.

In order to control these possible sources of poisons, it is necessary for public health officials to evaluate all specific and related information so as to determine the quantitative amounts which may be detrimental to the public health, and if necessary, establish tolerances and regulations. The question then arises how best to arrive at such conclusions. A vast literature has grown up in regard to the older recognized poisons so that a large part of the work would be in the evaluation of the literature. However, with the newer substances, or even with the older substances which have not been properly investigated, it will be necessary to design and carry out well-controlled toxicological investigations, and when the studies are complete, make proper evaluations of the data obtained. The following general plan of procedure is suggested:

A. Pharmacodynamics
   Blood pressure; respiration; heart rate; organ perfusion; isolated tissue preparations; etc.
B. Acute toxicity
   Dosage response curves on three or more species; objective symptoms; statistical calculations for comparative studies; simultaneous comparative determinations of other substances.
C. Subacute toxicity
   Large daily doses to one or more species for six to 12 weeks; microscopic pathology.
D. Chronic toxicity
   Three or more species; at least one species for the life of the animal; several dosage levels graduated to produce from no effect up to marked lesions, and possibly shortening life span; microscopic pathology.
E. External effects
   Sensitization; skin irritation; mucous membrane irritation.
F. Special studies
   Reproduction; hematology; absorption and excretion; distribution and storage; effect of diet.

This plan is obviously rather general and incomplete, but it can be changed to fit the individual case. For clarification, the following discussion and examples are presented.

A study of the pharmacodynamics of a substance often gives considerable useful information and usually provides one with preliminary data for further work. Effects on blood pressure, heart rate, respiration, nerve reflexes, smooth muscle motility, etc., can be advantageously observed on dogs, rabbits, or cats. The effect on isolated organs or tissues may also yield a good deal of information.

After the pharmacodynamic investigation is under way, the next most useful step is a determination of the acute toxicity of the material and the objective symptoms produced. For this purpose, the acute oral, intraperitoneal, intravenous, or subcutaneous dose should be determined on at least three species. The rat, mouse, and guinea pig are well suited for this, since these animals have been quite well standardized. Some investigators prefer to use, in addition, rabbits and cats. In any event, sufficient animals at a number of different dosage levels should be used so that it will be possible to calculate the dose that will kill a given percentage of the animals. The dose that will kill 50% (LD 50) is the one usually determined, since it can be most accurately estimated.[1] The steepness of the dosage response curve and the probable error of the determination should also be calculated. These data will then enable one to compare his results with those reported in the literature.

For certain substances which may act through inhalation or skin absorption, the method of procedure for acute toxicity determination should be altered so as to make the experiment applicable to actual experience.

It has been found in our laboratory that the determination of the sub-acute toxicity yields a great deal of information in a relatively short period of time. This determination also serves as a guide in the design of chronic experiments. In this type of investigation, rather large quantities of material are fed or injected daily to one or two species of animals, preferably rats, or rats and one other species such as dogs, monkeys or guinea pigs. The experiment is continued six to 12 weeks, at which time the animal is sacrificed and gross and microscopic pathology are observed. The dosage should have been high enough to produce a rather marked effect.

In this same category we include experiments on the effect upon the growth. Animals at weaning age (21-day-old rats) are carefully chosen and placed on experiment in such a manner that there are adequate controls. The substance can be given in the diet, be injected, or be given in any applicable manner. These experiments continue for at least 12 weeks, at which time the period of maximum rate of growth has been passed.

With the above information, we can now more intelligently plan a chronic experiment. As a matter of fact, if the subacute experiments have been properly started, they may in some cases simply be extended to cover a longer period of time. In any event, the experiment should be conducted on three or more species for the lifetime of at least one of them. Rats, dogs, mice, and monkeys are usually good chronic toxicity subjects. Since the life span of a rat is relatively short—two to three years— and since the rat has been well standardized in many laboratories, this animal is probably the best in every respect for lifetime chronic studies. In such experiments it is well to use several dosage levels of equal gradation from the dose sufficiently high to cause marked lesions, possibly shortening the life span of the animal, to a dose sufficiently low that there are no observable differences between the experimental and control animals.

The value of such long term investigations is well illustrated in the results obtained by Yoshida[2] who fed orthoaminoazotoluene to rats for 200-300 days to produce true experimental liver tumors. It has also been well illustrated in our own laboratory by studies on the glycols.[3] Ethylene glycol, for example, was fed in the diet of rats at levels of 1% and 2%. Kidney and bladder stones appeared in both series of animals. No stones were observed, however, in animals that failed to survive longer than 15 months. Another example is the production of neurofibromas on the ears of rats fed crude ergot.[4] These tumors first appeared after about 12 months and within 24 months were present on all animals receiving 5% of ergot in the diet. There

are many other examples, especially in the study of lead, arsenic, fluorine, selenium, and cadmium, where the long term experiment has yielded otherwise unavailable information. In all of these chronic experiments, it is obviously important that pathological studies be made.

Since a number of substances may exert their toxic effect by single or continued contact with the skin, an important part of every toxicological investigation is a study of the sensitization and irritant properties of the material in question. Guinea pigs have been extensively used for sensitization tests as described by Landsteiner.[5] Comparative investigations of other species have revealed that the white male guinea pig weighing 300-400 grams is by far the most consistent and dependable test animal for obtaining comparable results in sensitization studies. Skin irritation tests on rabbits or some other suitable animal should be performed. It is the consensus of opinion of investigators of skin irritants that the albino rabbit is the animal of choice when primary irritation of the skin is the question involved, since the results of tests made on these animals correspond more closely to the effects produced on man than the results obtained on any other species. Here the procedure may be the obvious one of application and observation, or it may involve other determinations such as the effect of the substance on the pH of the skin. Another test often used for irritant properties is the instillation of the substance in the conjunctival sac of the eye of the rabbit or some other animal.

In addition to the above experiments, which should be carried out for each substance studied, there are several special studies which should be done whenever they are at all applicable. It is in these special studies that one may often find the clue to the preventive measures which can be taken to avoid some of the results of the toxic actions of a particular substance. Reproduction studies are really a part of the chronic toxicity experiments and should yield information as to whether the substance in question will affect fertility, lactation, size of litters, and mortality of the young. Hematological observations are often of considerable value in conjunction with the long term chronic experiments. The presence of anemia, leucopenia, nucleated red cells, etc., is usually an indication of toxicity which may appear before there are other obvious signs. Moreover these observations often lead to the development of valuable diagnostic methods for the detection of specific toxic effects.

The absorption, excretion, distribution, and storage of a toxic agent will often guide one in an estimation of its probable effect. If there is an indication of storage of the toxic substance, one should watch for cumulative toxicity. If the material is rapidly eliminated from the animal, and no storage occurs, the toxicity from cumulation likely will not be as serious as the chronic toxicity which may result from the passage of the poison through the system. Some minerals, because of their low solubility in the gastro-intestinal tract and consequent poor absorption, constitute a less serious problem when ingested than when they are present as contaminants of the air. Of these, silicon dioxide is an excellent example. The rapid elimination of many of the coal-tar colors used in foods and drugs may account for the low toxicity of these compounds. The relative concentration of a poison in the tissues and organs of the body may sometimes indicate the most likely focus of toxic action. Mercury, for example, is found in the highest quantity in the kidney, which organ is the one most severely affected in mercury poisoning.

The effect of diet on the toxicity of poisons has been a subject of considerable investigation in recent years and there are several instances where relative toxicity has been related to the components of the diet. For example, high protein diets partially protect against the toxic action of selenium,[6] dimethylaminoazobenzene[7] and other compounds. A high calcium diet influences the rate of storage and toxicity of lead.[8] Further, it has been found in this laboratory that guinea pigs on a diet low in vitamin C are more susceptible to compounds such as the gycols and mercury salts.

If, instead of testing only one substance, a series of similar substances can be studied simultaneously, a great deal more information obviously can be obtained. When a number of substances are tested at once, a larger group of animals will necessarily be used and thus provide a better background for evaluating any one poison. Moreover, it often happens that the substance can be tested alongside a substance whose toxicity for man is known, and such comparative information is valuable.

Extensive investigations carried out on different species of animals are to our minds absolutely essential before a substance should be introduced into the economy of man. The experience and information thus obtained will then enable one to interpret observations made on human beings whether accidentally or industrially exposed to such a substance, or whether intentionally exposed under carefully controlled clinical conditions.

Interpretation of Toxicity Data

AFTER the toxicological data have been made available, the next major problem which presents itself is the interpretation of these data in terms of their applicability to the public health. The factors involved in making such an interpretation are numerous and complicated. In order that they may be more easily visualized, it seems advisable to present some of them in outline form, followed by a brief general discussion:

A. Variation between species
   1. Response of different species to a single substance.
   2. Response of different species to different substances. Contributory factors to the above differences in response are relative surface area and organ capacity, and differences in absorption, metabolism, detoxification, and excretion.

B. Variation between individuals in the same species
   1. Normal distribution and heterogeneity of the population.
   2. Physiological condition.
      (a) Age, sex, weight.
      (b) External environment.
      (c) State of physical exertion.
      (d) Pregnancy and lactation.
      (e) Presence of food in gastro-intestinal tract.
   3. Pathological condition.
      (a) Renal, cardiac, and hepatic insufficiency, etc.
      (b) Presence of infectious organisms.
      (c) Nutritional deficiencies.
   4. Multiple exposures.

Without pausing to reflect, one may be unaware that there are wide variations among species in their response to individual toxic agents. Moreover, it may not occur to many that man is more susceptible to the majority of toxic substances than is any other species. The variation in species response is illustrated by the acute toxicity of copper and mercury. Guinea pigs are very susceptible to these substances while rats and mice are relatively resistant. On the other hand, some experiments in our laboratory indicate that guinea pigs are more resistant to some of the organic amines

than are rats and mice. Such differences, then, must be considered for each substance studied. If careful toxicological experiments have been done on several species, and especially if comparative studies with known poisons have been carried out, a simple correlation should point the way for estimating the probable level tolerated by man. Direct translation from lower animals to man in terms of milligrams per kilogram of body weight is rarely possible and sometimes ludicrous. For example the rat can tolerate 100 milligrams of lead per kilogram per day for at least a year and survive, which in terms of a 70-kilogram man would mean 7000 milligrams per day. This is, in the minds of some investigators at least, 5000 times the amount that could be tolerated. Variability among species is further illustrated by the acute toxicity of diethylene gycol.[9, 10] As our toxicological data increase, more of these intercomparisons are made possible, and the more certain we can be of our judgment.

Species differences are undoubtedly a reflection of differences in physiology. The ratio of body weight to surface area, relative size of organs, vital capacity, etc., vary from species to species. In the metabolic processes and detoxification mechanisms there are likewise recognized differences.

Although investigators usually recognize and take into account variations among species, it sometimes happens that they do not as seriously consider the wide variations that occur among individuals of the same species. Even when they do recognize that there is individual variation, they do not recognize that it is the rule and not the exception—that in fact it is a normal biological phenomenon. There is a normal distribution in reactions to poisons just as there is a normal distribution in weights and heights of men and women. And just as there are a few very tall and a few very short persons, just so will there be a few very susceptible and a few very resistant persons to a given poison. Unless the investigator considers this, he may not allow for the extremes in the population. It is easy to demonstrate such a normal distribution in animals, and the slope of the dosage response curve is a reflection of the manner of this distribution. Some poisons for example, will give a graded response over a wide range of concentrations, while other poisons will give a graded response over only a very narrow range of concentrations. The human population is quite variable so that the graded response to most poisons will be over a wide range of concentrations. In applying animal toxicity data then, we must allow for a probable flattening of the dosage response curve for man, because of the fact that experimental animal colonies show less variability in the response to poisons.

The age, sex, and weight of the individual may have an influence on the toxicity of the poison. The size effect in guinea pigs treated with glycols has been reported.[9] The clinician has taken cognizance of the variation with age in prescribing separate doses for children and adults. Variations due to sex are most marked during pregnancy and lactation. The environmental temperature has an effect on the response to the action of some substances as has been demonstrated on rats for morphine, paraldehyde and pentobarbital sodium.[11] Physical exercise may directly and certainly can indirectly affect the results of exposure to a toxic agent. It is obvious that during strenuous physical exertion, one will breathe more air and in that way become exposed to more of an air contaminant. At the same time, the flushing of the skin in exercise may permit greater skin absorption of toxic agents. Moreover, the individual doing heavy physical work will eat more, and drink more than the sedentary worker and thus be exposed to greater quantities of a possible toxic agent. A large number of other conditions which might affect the toxicity of a substance undoubtedly exist.

The state of nutrition can easily influence the results of a toxicological investigation. For example it has been demonstrated that soluble tin salts exert an extremely irritant action on the empty gastrointestinal tract, whereas they show very little effect in the presence of food. Similar results have been obtained repeatedly in our own laboratory with other toxic substances. The lack of agreement between different laboratories investigating the same substance can often be explained by differences in the state of nutrition of the animals used in the experiment.

So far, we have discussed reactions on normal individuals. Our experiments have been carried out using normal healthy animals. But in the public which may be exposed, there are many who are most certainly not normal, healthy persons. We must consider then a rather large number of persons who are so unfortunate as to suffer from pathological conditions or disease. The yearly vital statistics are ample proof of the number of people who have cardiac, renal, or hepatic insufficiencies or cancer. Others may have anemia, respiratory infections and so on. Medical research is constantly striving to improve the health of this portion of the population and it would therefore seem that it is the duty of the toxicologist and the public official to take cognizance of those chronic poisons whose actions are specific for certain organs and tissues, and may be potentiated by such pathological conditions.

There are large areas in which the daily dietary is poor. Among the lower income classes, there may be insufficient funds to provide an adequate diet. Even in the well-to-do families, there are those who follow diet fads with a consequent failure to get a well balanced diet. The effect of the dietary on toxicity of poisons has already been discussed in the section on design of experiment, so all that need be said here is that there seems to be no reason why the experimental findings should not have a very practical application. In the relation of diet to toxicology it would seem that there is much room for preventive measures wherever there is unavoidable exposure to toxic agents.

In studying a toxic agent, one is likely to be considering only his own particular problem. However, he should not forget that the public is exposed to other poisons every day. There is the possibility that some of these poisons may have an additive or summation effect. Therefore, it becomes necessary to consider all possible sources of poisoning at the same time, in order to come to a judicious conclusion.

Summary

INCREASED exposure to toxic substances is a consequence of modern civilization. In order better to understand the problems of acute and chronic toxicity resulting from such exposures, well controlled toxicological investigations must be carried out. It is essential in these experiments that the levels causing acute, subacute, and chronic toxicity be accurately determined on several species of animals. Chronic studies must extend for the lifetime of the animal. Since the results of these experiments on animals are to be interpreted in terms of man, and since the tests are made upon normal animals under ideal conditions, all factors related to species variation and individual variation must be kept in mind when evaluating toxicity data in formulating tolerances or regulations for the protection of the public health.

References

1. BLISS, C. I.: The Determination of the Dosage-Mortality Curve from Small Numbers. *Quart J. Pharm. & Pharmacol.*, 11: 192, (April-June) 1938.
2. YOSHIDA, T.: Über die nebensächlich beobachteten Harnblasenepitheliome der mit o-Amidoazotoluol gefütterten Hepatomratten. *Gann*, 29: 295, 1935.
3. MORRIS, H. J., and CALVERY, H. O.: Chronic Toxicity of Some Glycols. Unpublished data from the Division of Pharmacology, Food and Drug Administration, Washington, D. C.
4. NELSON, A. A., FITZHUGH, O. G., and MORRIS, H. J.: Neurofibromatous Tumors of the Ears of Rats Produced by Prolonged Feeding of Crude Ergot. *Am. J. Pathology*, 624: (July) 1941. (Abstract).
5. LANDSTEINER, K., and JACOBS, J.: Studies on the Sensitization of animals with Simple Chemical Compounds. *J. Exper. Med.*, 61: 643 (May) 1935; 64: 625 (October) 1936; 64: 717 (November) 1936; 66: 337, (August) 1937.
6. LEWIS, H. B., SHULTZ, I., and GORTNER, R. A.: Dietary Protein and Toxicity of Sodium Selenite in the White Rat. *J. Pharmacol. & Exper. Therap.*, 68: 292, (February) 1940.
7. WHITE, J.: Retardation of Growth of Rat Ingesting p-dimethylaminoazobenzene (Butter Yellow). I. The Effects of Various Dietary Supplements. *J. Natl. Cancer Inst.*, 1: 337, (December) 1940.
8. CALVERY, H. O.: Chronic Effects of Ingested Lead and Arsenic. *J.A.M.A.*, 111: 1722, (November 5) 1938.
9. LAUG, E. P., CALVERY, H. O., MORRIS, H. J., and WOODARD, G.: The Toxicology of Some Glycols and Derivatives. *J. Ind. Hyg. & Toxicol.*, 21: 173, (May) 1939.
10. CALVERY, H. O., and KLUMPP, T. G.: The Toxicity for Human Beings of Diethylene Glycol with Sulfanilamide. *South. Med. J.*, 32: 1105, (November) 1939.
11. HERRMANN, J. B.: Effects of Certain Drugs on Temperature Regulation, and Changes in their Toxicity, in Rats Exposed to Cold. *J. Pharmacol. & Exper. Therap.*, 72: 130, (June) 1941.

Hygienic Disposal of Collected Dry Dusts

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IT IS generally agreed that the most efficient dust collector for fine dry dusts is a cloth filter type collector, either the tubular or envelope type. However, one of the most serious objections to dry collection is the possibility of recirculation of part of the collected dust while unloading the collector hoppers.

In the past, the usual practice was to unload dust hoppers when there was a minimum number of workers in the plant. However, this is not always possible at the present time when a majority of plants are working round the clock shifts.

The simplest method of minimizing dust dispersal is to install flexible spouts, usually canvas, on the bottom of the hopper valves. These should extend well below the top of the dust receptacle. By allowing the spout to first fill with dust and then by carefully raising and lowering the spout with the lower end touching the dust pile or bottom of the container, many operators are able to empty hoppers with very little dust dispersed.

Many dry collectors are equipped with enclosures around the base of the unit. This prevents the circulating air currents from picking up any float dust created in unloading.

The use of a screw conveyor to connect all hoppers and bring the dust to a single discharge point is to be recommended in some cases. The addition of an air lock valve to the conveyor allows discharge of the dust while the exhaust fan is operating.

There are many designs of sealed top containers which are flexibly connected to hopper spouts. In some cases, provisions are made for exhausting the container while the air is being displaced by the falling dust. However, these systems are most easily applied to small installations or where the quantity of dust is small and can be handled readily in a portable steel barrel.

All these devices control the dust disposal into portable containers to a varying degree, but most dusts have to be transported from the collectors to a dumping ground which might be several miles from the plant. During transportation, it is quite probable that a considerable amount of the dust will be blown out of the truck by the wind or spilled out of the truck by the vibration of driving. This condition will eventually result in complaints from residents and might even bring restraining orders from municipal governments.

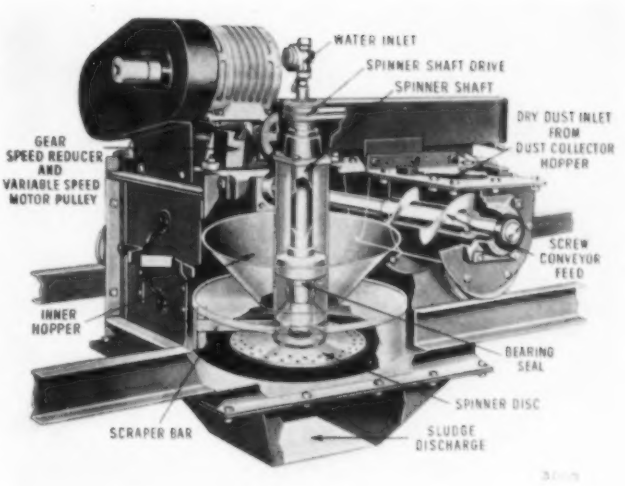

Fig. 1
Mechanism of wet dust disposal unit

The wet disposal of dry dusts offers the advantages claimed for wet dust collectors without any of the ordinary operating troubles of these units, and together with a filter type collector provides the most efficient dust collecting system for dry materials.

Fig. 1 shows the wet disposal unit built by the American Foundry Equipment Company.

The dry dust flows by gravity from the collector

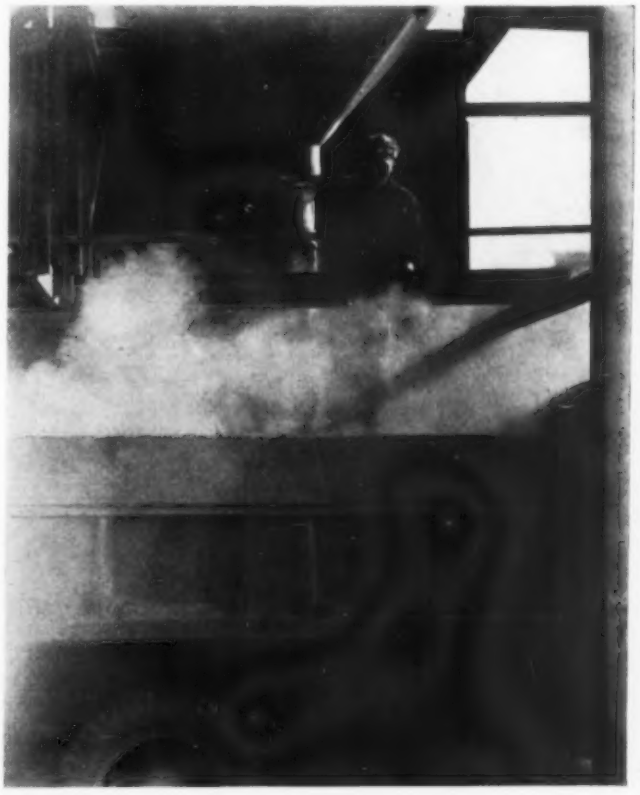

Fig. 2
Dust cloud resulting from discharge of hopper with no dust control measures

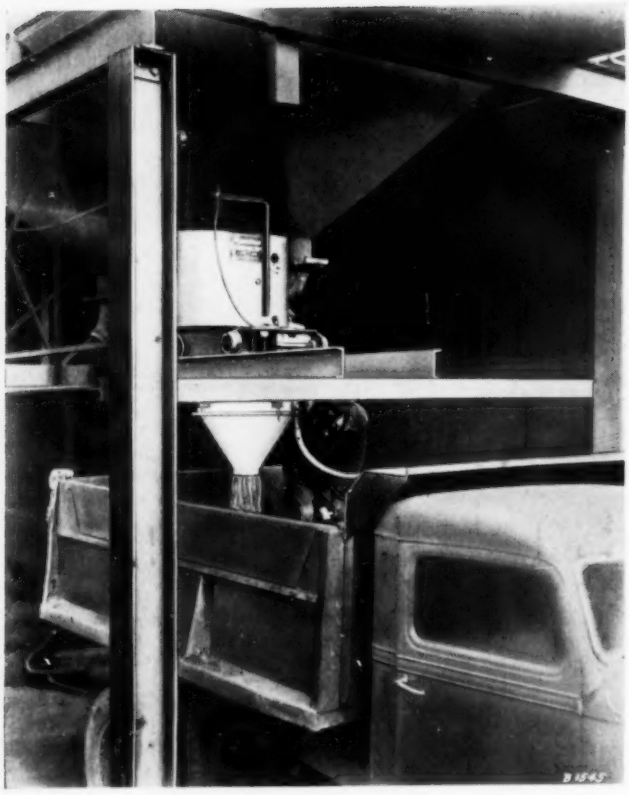

Fig. 3
Discharge of dust from hoppers through wet disposal unit

hopper through a flexible coupling into the built-in screw conveyor feeder of the disposal unit. The dust is carried by the conveyor at a uniform rate of feed to an inner hopper within the housing of the unit.

Water is fed through the hollow rotating spinner shaft and is thrown outward by centrifugal force through the space between the shaft end and the high speed mixing (spinner) disc.

At the same time, the dust is flowing from the inner hopper by gravity, and falling on the spinner disc through the annular opening between the hopper bottom and the central bearing tube.

The impact of water and dust on the high speed spinner disc results in an instantaneous mixture or sludge.

The consistency of the mixture can be varied by means of a variable speed drive for the screw conveyor, and a lever operated water valve.

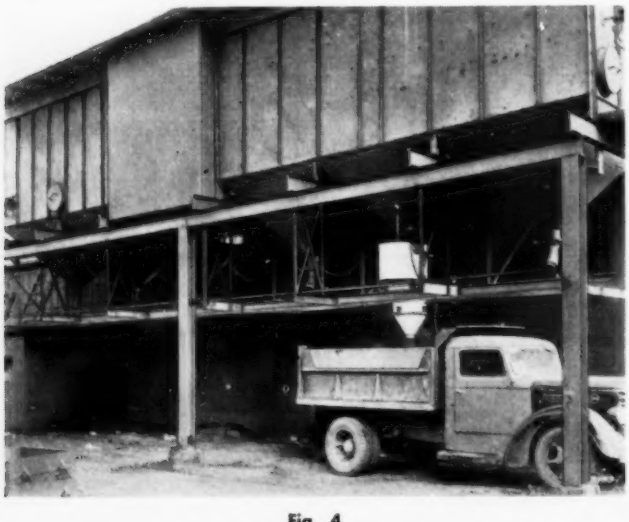

Fig. 4
Disposal of dust as wet sludge from collector hopper

Ordinarily, the wet disposal unit is mounted on wheels and can be moved on a track to any station of a multiple hopper collector. This, of course, requires flexible electrical cable to the motors and a rubber hose for the water supply.

Many units are equipped with an auxiliary screw conveyor serving all hoppers, allowing the disposal unit to be mounted permanently in one position for remote control from ground level.

The amount of dust which can be handled by the wet disposal unit depends upon the type, size, and specific gravity of the dust; also upon the desired consistency of the mixture. Sand dust is handled most readily; some installations mixing as much as 5 cubic feet per minute.

If a very dry mix is desired, without any free water apparent to the eye, there will be a slight noticeable amount of dry dust escaping the unit; less than 1% of the material handled. If 100% suppression is required, it will be necessary to run a thinner mix which might require water-tight containers.

As the unit is not a batch type mixer, allowance must be made for an excess of water at the start of operations until the dust is flowing steadily, and for flushing out the unit after operation. This excess water is absorbed by the dust load in a very short time.

The wet disposal unit can be operated outdoors during freezing weather, unless the temperature drops to about +10° F. Provisions must be made for a drain cock inside the building wall, and a rubber hose with quick couplings for easy return of the water line to the inside of the building.

Where dust collectors are located inside manufacturing buildings it is especially important to provide some means of avoiding dissemination of dust as it is removed from the hoppers under the collectors. Even where the collectors are located outside, the worker discharging the dust from the hoppers is exposed to a heavy dust exposure as shown in Fig. 2 unless control measures are instituted. The elimination of dust during this operation by means of the wet disposal unit is well illustrated in Figs. 3 and 4.

Industrial Hygiene Meetings

—Abstracts of Papers of the Industrial Hygiene Section Meetings of the Seventy-First Annual Meeting of the American Public Health Association, St. Louis, October 26-30, 1942—

Reported by

C. O. SAPPINGTON, M.D., DR. P. H.

THE attendance at the industrial hygiene meetings at the St. Louis Convention of the American Public Health Association reached an all-time high in the 27 years' existence of the Industrial Hygiene Section. Likewise, there was much enthusiasm in the discussions, and a comprehensive program covering many different types of interests.

Starting on Monday with a Symposium "Industrial Health Work Pays," there followed on Tuesday a Symposium on "Industrial Hygiene and the War," a Symposium on "Training of Industrial Hygiene Personnel" on Wednesday, and also on the same day the usual Industrial Hygiene Section luncheon with reports of the various committees; on Thursday a Symposium on "Chemical and Engineering Methods in Industrial Hygiene," with an afternoon meeting devoted to miscellaneous subjects; closing on Friday with a joint meeting with the Food and Nutrition Section.

Monday Afternoon

MR. W. SCOTT JOHNSON, the first speaker in the Symposium on "Industrial Health Work Pays," discussed the subject "How Does Health Pay?"

Now that there is more work than workers, health is of greater importance and more vital to production.

What is the tangible value of keeping well? Assuming 10 days absenteeism on the average, if a 10% reduction was accomplished, some 70 million days might be saved, possibly turning the tide in our favor in the war effort.

The health program should be responsible for all loss factors and is really a program of adult hygiene.

We have to consider of course, that medical care has been greatly curtailed in most districts on account of the war needs, and therefore, the necessity for the correlation of community health services.

There is an example in the State of Missouri, in which the State Health Department, assisted by local field agencies, was able to provide two metropolitan programs in Kansas City and St. Louis. These programs stress the following: (1) advisory service to plant management on hazards; (2) a system of records and analysis; (3) the encouragement of medical services; (4) stimulating the interest of physicians and nurses; and (5) the planning of local services.

MR. E. E. NEFF, a representative of the St. Louis Shipbuilding and Steel Company (not listed on the program), spoke on the experience of his company.

Labor is entitled to the same courtesy in seeking employment as salesmen.

The company has emphasized a program on the humanitarian angles, believing that individuals can serve in some capacity even if they are somewhat defective physically. In this program, it is emphasized that there should be no encroachment on private practice.

When the prospective employee presents himself for physical examination, he is greeted by a mature receptionist who makes the applicant feel at ease. He is given an appointment for an interview and the receptionist introduces the applicant to the interviewer and takes him to the interviewing room. At first, nothing is said about the work, but eventually it is determined if he is capable of the employment which he seeks. He is told the approximate date of his employment, his application is checked, and he is returned to work, with the selection of a job. Later on, he is examined. If there is rehabilitation necessary, the job is fitted to him in terms of his rehabilitation program. The minimum age of acceptance is 18 and there is no maximum limit, but the physician's judgment in making the examination is the determining factor.

Under the present labor conditions, 20/60 vision is accepted. Blindness in one eye has been accepted for certain jobs. For hearing, 8/20 has been approved. Those having trench mouth, septic sorethroat, and fever, are temporarily excluded. Stiff joints and amputations are accepted for certain types of employment. There is no set blood pressure standard, again relying upon the examiner's judgment. Employment is not denied lung cases without the advantage of x-ray diagnosis. Hernia well supported by a truss is acceptable. For those having varicose veins, again the judgment of the examiner is used.

All applicants receive a blood test and if positive, when the applicant is put under treatment and continues, he is accepted for employment, at the discretion of the examiner. Cooperation with private physicians in this work is very necessary.

Food handlers are examined every month, and everyone has an exit examination at the termination of employment. Vaccination against smallpox is optional.

In each case, after the examination findings have been recorded, if the employee has any restrictions as to his capacity, these are called to the attention of his superintendent.

This program works very well in this organization.

LAVONA BABB ROSS, R.N., spoke on the subject "Industrial Nursing Pays." The experience was detailed in a plant of 600 employees with a physician on call.

The service provides for a pre-placement examination, reference and follow-up; phone calls on injured cases or by request; health education; cooperation with the safety department; sanitary inspections; check on return to work; individual conferences; recommendations for placement on entrance to employment and periodically; nutritional advice; with confidential records on sickness, injuries, and absenteeism.

In this program, the nurse is useful in the following ways: (1) teaching hygiene, nutrition, etc.; (2) early case finding; (3) first aid and care of injuries; (4) assisting in immunization; (5) control of return to work; (6) contacting homes; and (7) assisting in prevention of accidents by reporting observed hazards.

It has been found that the employee morale is greatly helped by a nurse with a sympathetic attitude and one who will maintain confidence in the service.

The nurse is of value to the employer by helping to reduce absenteeism, occupational diseases, and injuries, as mentioned by the National Association of Manufacturers figures. There is also a saving in promoting sanitation, and the speeding of production by helping the workers keep healthy.

Insurance companies approve of industrial nursing because there are (1) careful management of cases; (2) prompt and efficient first aid; (3) proper referral; (4)

Program

Monday

SYMPOSIUM "Industrial Health Work Pays," JOHN BUXELL, presiding:

How Does Health Pay?—W. SCOTT JOHNSON.

Industrial Nursing Pays—LAVONA BABB ROSS, R.N.

Employee Benefits from Industrial Health Work—DR. ELMER RICHMAN.

Making Medical Control in Industry Pay—DR. CHRISTOPHER LEGGO.

Tuesday Morning—First Session

PRESIDING: WILLIAM P. YANT, Chairman: Address of the Chairman.

Symposium on Industrial Hygiene and War:

The Industrial Hygiene Program of the Army Medical Corps—LIEUT.-COL. A. J. LANZA, M.C.

The Program of the United States Navy—CAPT. C. S. STEPHENSON, U.S.N.

The Program of the United States Public Health Service—JAMES G. TOWNSEND, M.D.

Unexpected Occupational Disease Exposures During Wartime—JOHN J. PRENDERGAST, M.D.

Wednesday Morning—Second Session

SYMPOSIUM on Training of Industrial Hygiene Personnel:

The Training of the Physician—CARL M. PETERSON, M.D.

The Training of the Hygienists—DONALD E. CUMMINGS.

Undergraduate Training—MILTON H. KRONENBERG, M.D.

Wednesday—Luncheon Session

ADDRESS E. R. A. MEREWETHER, M.D.

Report of the Committe on Skin Irritants—Chairman, LOUIS SCHWARTZ, M.D.

Report of the Committee on Ventilation and Atmospheric Pollution—Chairman, EMERY R. HAYHURST, M.D.

Report of the Committee on Standard Methods for the Examination of Air—Chairman, EMERY R. HAYHURST, M.D.

Report of the Committee on Lead Poisoning—Chairman, ROBERT A. KEHOE, M.D.

Report of the Committee on Pneumoconiosis—Chairman, R. R. SAYERS, M.D.

Report of the Committee on Industrial Anthrax—Chairman, HENRY FIELD SMYTH, M.D.

Thursday Morning—Third Session

SYMPOSIUM on Chemical and Engineering Methods in Industrial Hygiene:

A Critical Study of the Phenoldisulfonic Acid Method for the Determination of the Oxides of Nitrogen—HELMUTH H. SCHRENK, PH.D.

The Determination of Halogenated Hydrocarbons—FREDERICK H. GOLDMAN, PH.D., and CHARLES G. SEEGMILLER, PH.D.

A Practical Housekeeping Program for Industry—HERBERT G. DYKTOR.

Thursday Afternoon—Fourth Session

THE Acute Toxicity of Vapors of Several Mono-Alkyl Ethers of Ethylene Glycol—HAROLD W. WERNER, PH.D., JAMES L. MITCHELL, JOHN W. MILLER, M.D., and WOLFGANG F. VON OETTINGEN, M.D.

Physiological Response to Inhaled Magnesium Dust—LEROY U. GARDNER, M.D.

Monomeric Styrene—DON D. IRISH, PH.D.

Industrial Eye Health Problems—HEDWIG S. KUHN, M.D.

Friday Morning—Joint Session

PRESIDING: WILLIAM P. YANT and HENRY T. SCOTT, PH.D.

Food and Nutrition of the Industrial Worker in Wartime—FRANK G. BOUDREAU, M.D., and ROBERT S. GOODHART, M.D.

Teaching Nutrition to the Families of Industrial Workers—EVELYN HOLLEN.

The Functions of Nurses in Industry—OLIVE M. WHITLOCK, R.N.

Improved Dental Health for Workers—LYMAN D. HEACOCK, D.D.S.

Conception Control in Industrial Hygiene—EVA DODGE, M.D.

follow-up, stimulating early return to work; (5) follow-up on physical examinations; and (6) cooperation with safety committees.

The nurse's services pay the doctor because of (1) explicitly following orders; (2) follow-up procedures on the physical examinations; (3) the saving of time; (4) case routing; and (5) the frequency and intimacy of contacts, leading to confidence in the service.

Industrial nursing services pay the community because of the many contacts with the various agencies interested in nutrition, venereal disease, tuberculosis, blindness, heart disease, assisting in exploding fallacies, in early case-finding and isolation, and also rehabilitation.

All in all, the nurse's service in industry contributes to the maintenance of the things that go to make up the United States of America, and to the preservation of our many freedoms.

IN THE absence of DR. ELMER RICHMAN, his discussion of "Employee Benefits from Industrial Health Work" was given by DR. H. G. GREDITZER.

A review of the usual statistics on absenteeism was presented. It was stated that a coordinated program pays because it is good business. In this, labor relations are quite important.

The barrier between curative and preventive medicine must be broken down, to obtain good results in industrial health programs.

In union groups, it has been found that $18 per year per person is the cost of the usual type of medical care which can be practicably rendered.

It should be now realized that the problem of industrial health is an emergency at the present time.

Statistics show that three and a half billion dollars a year are expended for medical care; that two and a half million people are sick at one time, and that 10 billion dollars are lost from sickness each year.

To provide for adequate compensation for the medical profession, there should be (1) a prepayment budget; (2) a well organized medical care program; and (3) a profession industrially trained.

DR. CHRISTOPHER LEGGO discussed the subject "Making Medical Control in Industry Pay."

Medical control in industry may be made to pay in dollars and cents; in employee-employer relationships; in higher standards of care; in personal efficiency; and in the war effort.

It is significant that every program must be fitted and altered to the individual industry, as needed.

In reviewing the evolution of the present compensation system, and commenting upon its program in industry, it was stated that the compensation program at present helps everybody, although it has certain defects.

Complete medical care is not regarded at present as the industrial pattern.

Success in any medical control program involves "calling the balls and strikes" as one sees them, without prejudice.

It is essential that the medical control program fit in with the administration of the company; one may compromise policies but never principles.

The program must, moreover, be built on conservatism; one should beware of new devices, drugs, nostrums, and such.

It should be borne in mind that the medical department must keep out of disputes—and recognize conditions as they are and not as what they might be.

The matter of records can be overdone; the confidence of the employee must be retained. Both of these important principles (namely brief records and confidence of employees) can be done at the same time without difficulty.

It is essential that the medical personnel (which includes nurses) must not only know what to do, but also what use to make of what is done; it is of little avail that the results of physical examinations are not put to proper use, and if results of blood testing programs are likewise left unused.

Finally, medical control programs in industry must not only pay, but must last.

COMPLETING the symposium, MR. P. N. BUSHNELL, Director of Industrial Relations of the Missouri Portland Cement Company, St. Louis, spoke on "Evolutionary *vs.* Revolutionary Changes in Industrial Health Work."

Briefly, it was emphasized that the following points are important in the program: (1) proper and adequate care of injuries; (2) rehabilitation of individuals as soon as possible; and (3) proper use of examination records for placement.

It is recognized that the matter of privacy of records is really a problem. This cannot always be settled on the basis of a static policy; a flexible system must be used in order to secure the best results, since there are exceptions to the rule of privacy of records which sometimes create problems which cannot be settled in any other way than by the use of a flexible policy.

Personnel relations managers and employment managers also want to "lean on" the medical profession, but frequently the profession does not desire this to take place, in assuming responsibilities for decisions as to employability.

Finally, it was stated in detailing various experiences in medical control programs as related to personnel administration, that what is needed is better "administrative intelligence" as to records and policies.

Tuesday Morning

MR. W. P. YANT, Chairman of the Section, gave the annual Chairman's Address.

In contemplation, one is greatly impressed with how much there is known and how much there is to work with in industrial hygiene, as compared with how little there was when the section was founded in 1914. We have now passed into offensive tactics. It is fair to say that industrial hygiene is as near ready as it could be expected to be.

The war will probably advance the cause of industrial hygiene at least one to two decades. The influence and the benefits of industrial hygiene work will grow; there are many avenues of expansion.

Workers will take back knowledge of preventive measures into their postwar jobs in the industries where they were formerly located. This may represent the beginning of the important principle of instruction of the individual worker.

More than ever now is there research, and great amounts of money expended in the field of industrial hygiene.

We must continue to render service in manpower and production, neither at the expense of the other. We must continue to prosecute research. Instruction of the individual worker must continue. More nurses can be used. Finally, great impetus will be given to all phases of industrial hygiene work by the war effort.

LIEUT. COL. A. J. LANZA, M.C., began the Symposium on Industrial Hygiene and War in a discussion of the subject "The Industrial Hygiene Program of the Army Medical Corps."

The mechanics of warfare brought industrial hygiene to the army. Hazards of operations, maintenance and repair are involved.

An armored force research laboratory has been established at Fort Knox (especially with reference to tank corps activities) and a wide variety of personnel has been used, concerned with the technical problems of mechanics and communications.

The army now owns more than 160 industrial plants and more than 250 are under construction, including the manufacture of munitions and machines; there are now employed about 600,000 persons.

An occupational hygiene branch of the Army Medical Corps has therefore been established with functions in two main activities: (1) where possible, experienced physicians are assigned to plants—industrial physicians and industrial engineers are assigned to the various service commands; and (2) an industrial hygiene laboratory has been established at Johns Hopkins University at Baltimore.

The occupational hygiene branch of the corps is for-

tunate in having the invaluable aid of the U. S. Public Health Service with its vast experience. The occupational hygiene branch will act as an active liaison with the various service departments.

CAPT. S. C. STEPHENSON, U.S.N., discussed "The Program of the United States Navy."

It has been found necessary to stretch personnel in industry, hence this condition presents certain problems. Temporary "straining" however is not warranted.

The Council on Industrial Health of the A.M.A. has set forth certain objectives of industrial health which were restated.

For years the Navy has had a comprehensive safety program. It is now recognized that efficiency and health cannot be divorced.

A Section on Industrial Health was established in the Navy early in 1941, serving shore establishments, training officers for staffing, and supplying trained engineers and physicians. There is a safety officer for each 1500 employees in the naval industries. The usual pre-employment and check-up examinations for special occupations are done, and also the periodic checking of control measures is carried out.

Analyses of injuries and illness are shown in a statistical report, and these form the basis for changes in the regular program.

The Navy continues to prosecute a positive program in prevention.

DR. JAMES G. TOWNSEND discussed "The Program of the U. S. Public Health Service." Industrial hygiene programs now assume A-1 priority rating.

It has been the practice of the Public Health Service to follow the program outlined by the Subcommittee on Health and Industrial Medicine.

At the present time, there are 38 states, two county, three city and three regional industrial hygiene units, which are supervised by the Public Health Service.

Industry as a whole is probably now employing 15 million war workers, which will probably reach 17.5 million by 1943. During 1942 there were probably two and a half million workers reached in 32 states and in 5000 plants by the activities of the industrial hygiene bureaus.

There are now four mobile units working on various plant surveys and 65 have been completed at the present time. Reciprocal relations have been also established with the OCD in plant defense.

Research is being conducted for the Army and Navy in aviation and munitions plants, and many projects are in work. There is a training course in industrial dermatology. Also there are plans being promulgated to assist consultants in medicine and dentistry in coordinating their services.

Various surveys have been conducted, such as ventilating studies in the use of toxic vapors—study of x-ray methods through the use of mobile units—and there has been assistance rendered in a survey of industrial nurses.

An outline of plant survey records forms has been prepared and distributed. A manual of industrial hygiene and industrial medicine is now being prepared and will be ready in a few months. An annotated bibliography on industrial psychiatry is being prepared, and also an alphabetical list of educational material.

The major problem is lack of adequate community health services in mushrooming industrial areas.

In conclusion, preventive programs are vital in wartime efforts and their extension is very necessary.

AS THE final number in the Symposium on Industrial Hygiene and War, DR. JOHN J. PRENDERGAST discussed the subject "Unexpected Occupational Disease Exposures during Wartime."

Wartime activities in industrial hygiene have served to demonstrate the attitude of industry. In contemplating the prevention of disease, the necessity arises for the investigation of new materials, but keeping up with the old, because of increasing use by uninstructed employees.

Among the substances necessitating investigation because of increased use by uninstructed employees or because of unusual uses, were benzol, carbon tetrachloride, and lead tetraethyl. The latter substance is used in increased amounts now in gasoline and for cleaning purposes, as well as for fuel.

Dermatitis problems have also been encountered in cycle welding, from dyes and resins on canvas tarpaulins—this latter problem has now been solved by changing the filling materials used. Another important dermatitis problem arose because of bronze itch from an alloy of aluminum and magnesium.

A noise problem has been found to give concern in the testing of motors, which has been solved by the acoustical treatment of control chambers. The employees are now given audiometer, electrocardiograph, and basal metabolism tests.

It is important to understand that a great many problems have necessarily arisen because of priority restrictions.

Although industrial hygiene has always been very important, it is now more necessary than ever to observe due precautions for the health protection of industrial workers.

THE discussion which followed this symposium was participated in by DRS. SMYTH and HAYHURST, who gave a historical resumé of industrial hygiene activities, including a reference to spray coating, sandblasting, and carbon tetrachloride studies—the Illinois survey on occupational diseases, and other interesting phases of industrial hygiene developments.

DRS. MCCONNELL, SHEPARD, GRAY and TOWNSEND also participated in the discussion. More confidence should be placed in real preventive measures rather than in treatment. The experience in the California Institute on Industrial Health was cited by DR. SHEPARD. DR. ALBERT GRAY talked about the work, on the east coast, of various industrial hygiene bureaus, stating that the Connecticut Bureau made upward of 5000 blood tests a month on industrial employees; that the industrial physician is really the health officer in the plant. An important announcement was made concerning the fact that Yale University is now working on a program for small industries. DR. MUDD emphasized the control of communicable diseases in industry, and DR. TOWNSEND announced that a statement of policy regarding venereal disease would be issued by the U. S. Public Health Service.

Wednesday Morning

THE Wednesday morning session was a Symposium on Training of Industrial Hygiene Personnel. DR. CARL M. PETERSON opened the symposium by discussing "The Training of the Physician."

A quotation was given from the statements made by the Procurement and Assignment Service as to what an essential physician is in industry. This was discussed with reference to the stabilization of personnel and other recommendations of the Procurement and Assignment Service were quoted.

The State Committees on Industrial Health were mentioned and their functions outlined.

The Council on Industrial Health of the A.M.A. can be of considerable help in establishing training centers for the use of general and special practitioners. This can be accomplished by assisting medical schools all over the country in the establishment of these courses, both for regular medical students and also for post-graduate work in various communities. A three-weeks course, for example, could be based on the outline of the previously published combined report (referring here to the combined report by the Council on Industrial Health of the A.M.A. and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS). The course at the University of Virginia, at Richmond, was cited as an example of a successful one in a medical school.

Fellowships of $250 a year may be available at a later date through the activities of the A.M.A. Council on Industrial Health.

It is planned to have continuation courses for general and special practitioners at periodic intervals.

Graduate instruction is also being planned, with arrangements being made for residencies and fellowships. These may take the form of six months of industrial toxi-

cology, six months of hospital experience, and six months in an industry. After such instruction, certification might be possible.

County committees on industrial health are now beginning to be set up in various areas, on which there is represented the private practitioner, the industrial practitioner and a health official.

In conclusion, it was emphasized that it is highly important that we capitalize on the widespread interest in industrial health for sound planning and organization.

IN THE discussion of Dr. Peterson's paper, DR. FREDERICK J. WAMPLER emphasized the necessity of interesting insurance men; DR. SARAH I. MORRIS, of Philadelphia, discussed briefly the eight weeks course in the Women's Medical College of Philadelphia, in which the course is scheduled for two hours a day for three days a week, in the late afternoon; and DR. R. R. SAYERS pointed out that it was necessary to teach preventive medicine to all of the groups engaged, including physicians, engineers, chemists, and nurses.

PROF. DONALD E. CUMMINGS discussed "The Training of Hygienists."

There has been a great impetus during the past 10 years on the integrated application of specialized engineering and preventive medicine to industry.

It is obvious that war accentuates hazards, exposures and unhealthful conditions. But in the military services better selection of men is possible and the priority problems are less serious than in private industry.

For purposes of real sound functioning, the hygienists should probably have a personnel pool similar to the medical pool of the Procurement and Assignment Service.

Emergency training courses probably will displace the usual methods and courses of instruction. Instruction should include the education of representatives of industry, and practical demonstrations are vital. History taking is most important. Industrial clinics are essential to the proper demonstration of material and the handling of it. There should be cooperation with other departments of universities and also with state bureaus. This is the opportunity for the instructees to practice technical procedures under supervision.

IN THE discussion of PROF. CUMMINGS' paper, LIEUT. COL. LANZA stated that he thought some of the things proposed by PROF. CUMMINGS would "be spreading the butter pretty thin." It is important for us to realize that one cannot refuse men who want to enlist; in other words, enlistments cannot be controlled. Contrary to PROF. CUMMINGS' opinion, there are greater hazards in war production industries than in civilian production. Engineers should have similar intensive training, as has been arranged for doctors.

DR. WILLIAM G. FREDRICK, in discussing the presentation, emphasized certain points: (1) that courses at the University of Michigan are available for intensive training; (2) that war production plants are modern, but priority ratings frequently balk progress anyway; (3) a working arrangement with the Department of Labor and Industry has been found extremely useful, as this department uses inspectors who represent scouts who find suspected hazards which later can be investigated properly.

In his discussion, DR. HENRY FIELD SMYTH, SR., emphasized the importance of field demonstrations in the teaching of industrial hygiene—the internship will be also be of great value in training.

DR. MILTON H. KRONENBERG completed the presentations in this symposium, speaking on "Undergraduate Training."

Courses are supposedly not to be changed in the regular curricula, but this does not necessarily hold true. Undergraduate work in industrial hygiene must be made available on more frequent and better organized bases.

In reviewing the courses given by medical schools, the following facts were found: in 1928 four schools gave courses; in 1940, 52 schools gave courses averaging five hours, and in 1941, the average of the courses given was over six hours.

The older method of teaching by the division of work, alloting certain portions of industrial hygiene and industrial medicine to different departments has not been productive of the desired results. This means that there must be a regular course and if possible, a regular department as such.

Courses in medical schools must be well organized and a group of lecturers used to get the best effect. There should be a required course in the junior year and an elective course in the senior year. Clinical clerkships should be provided, and an occupational clinic set up for the demonstration of out-patient material. There should be a short intern service in industry if this can be practically arranged, approximately six weeks being desirable.

Finally, it is important to bear in mind that the science of medicine is applicable to industry.

In discussing DR. KRONENBERG'S presentation, DR. ALBERT GRAY mentioned the seminars which are being held at Yale University, involving a one-hour lecture and a two-hour discussion period, with a bibliography being provided. It was also stated that 90-hour courses are now being planned for various areas throughout the country. What is really needed is the development of cooperative effort with industry, the official agencies, physicians, engineers, and others who are in the program.

In closing the discussion, DR. E. R. A. MEREWETHER, of Great Britain, very appropriately mentioned that industrial hygiene, the Cinderella of medicine, is now casting off her rags and becoming respectable.

Wednesday Luncheon

THE regular Industrial Hygiene Section luncheon, including the reports of various committees, was held as usual, this time the guest speaker being DR. E. R. A. MEREWETHER, of Great Britain.

DR. MEREWETHER stated in the beginning that he was no Daniel, but that he has seen a lot of lions.

The Factory Act in Great Britain places certain responsibilities on the personnel of the inspection service, which includes the function of enforcement. The work is arranged cooperatively with the trades unions.

Minimum legal standards are posted in every factory so that they will be well understood. It is well known that the accepted definition of inspection in Great Britain means to look, to inquire, and to aid. A quotation was read from the regulations stating "The inspector functions by persuasion, with sanctions in the background."

At the present time there are 347 inspectors, and these represent the background of the work done through the Ministry of Labor and National Service.

The blackouts probably represent the greatest problem, creating lack of ventilation and other difficulties, which have been much improved lately.

The lesson of working hours has had to be relearned, and there have had to be many readjustments. At present, there is no restriction of activity except for young persons ages 14 to 18 and for women. Rotation is practiced in certain jobs and is quite helpful.

There have been definite changes in the age distribution of the population. The age group 30-50, for instance, involving 50% of the population, and those over 50 involve almost the other 50%. This change of age distribution, which of course has come about gradually, has been one of the great factors in absenteeism.

Many women have been employed under the age of 45, which also increases the problems in industry. There has been a great increase in tuberculosis in all age groups. Lice and scabies represent another problem in sanitation.

There have been some increases in various types of chemical poisonings, for example, poisoning due to nitrous gases has been increased 24 times, but there has been only one death. Carbon monoxide cases are also increased. The figures for toxic jaundice from the period July, 1916-1917 were 308 cases with 79 deaths, whereas the years 1941-42 show only 37 cases and 10 deaths. Dermatitis is up three to four times, and it is important to say here that

this disease is not compulsorily notifiable. Accidental injuries are up considerably, with a greater proportional increase among women.

Orders for various types of services have increased greatly, such as an increase in medical, welfare and nursing, and also in the installation of canteens serving hot low-priced meals.

Nurses have been found to be great morale builders. There are now 30% women inspectors in the service. Women in general have "delivered the goods."

Changes among industrial workers from place to place have been very much restricted, and are now regulated to a considerable extent in that changes can only be made for so-called adequate reasons.

THE regular reports of committees were given by the chairmen of the various committees, as noted in the program, the reports to be published later, but summaries can be given here.

DR. LOUIS SCHWARTZ, chairman of the Committee on Skin Irritants, reported for that committee. Dermatitis is way ahead of other occupational diseases in incidence, constituting about 95% of the occupational diseases reported in war production industries. One of the difficulties encountered is the use of substances formerly used and for a time discontinued, but now being used again by the uninitiated and unsupervised workers. An important principle now is to treat the worker on the job so that he may become desensitized. The rationale of protective ointments and skin cleansers has now been well developed and can be applied by those who need it. It is important that the education of dermatologists and physicians continue with respect to the problems of industrial dermatoses. The committee now has in preparation an abstract of the literature.

DR. EMERY R. HAYHURST, Chairman of the Committee on Ventilation and Atmospheric Pollution, reported very briefly on the work of the committee. An important factor is keeping the wall temperatures higher than the air temperatures during the winter months and vice versa; this principle helps a great deal in maintaining healthy air principles, but other factors must also be considered.

DR. HAYHURST also reported for the Committee on Standard Methods for the Examination of Air, citing the work of Dr. Goldman with reference to chemical procedures for the determination of cadmium and hydrogen sulphide in the air, and also stating that MR. BLOOMFIELD, the Chairman of the Subcommittee on Dust procedures had no additional report to make. The subcommittee on Bacterial Procedures in Air, chairman of which was MR. WILLIAM WELLS, had no report.

DR. ROBERT A. KEHOE, Chairman of the Committee on Lead Poisoning, stated that this committee has brought its work almost to completion during the past year. There is in preparation a bulletin which will deal with various aspects of industrial lead poisoning in a comprehensive manner and bring the discussion and recommendations into line with current knowledge and the best of present practices. The first section of the bulletin had been reported upon at the 1941 meeting; the final report will soon be submitted for publication, possibly before the end of the calendar year of 1942, and will provide 60 or 70 printed pages of discussion, the purposes of which are (1) to outline practical and effective measurements for the recognition and prevention of hazardous lead exposure in industry; (2) to describe satisfactory methods for the differential diagnosis and treatment of lead intoxication; and (3) to clarify the medicolegal aspects of occupational lead exposure and absorption. A classified list of references will be appended.

DR. R. R. SAYERS, Chairman of the Committee on Pneumoconiosis, made a progress report, but stated that there was nothing new to be reported from this committee.

DR. HENRY FIELD SMYTH, briefly commented on the report of the Committee on Industrial Anthrax. Apparently there has been a definite increase in anthrax cases around Philadelphia in textile mills, and this condition should be checked critically to avert the continued increase of anthrax cases in postwar periods.

Thursday Morning

THE Thursday morning session of the Industrial Hygiene Section was a Symposium on Chemical and Engineering Methods in Industrial Hygiene.

DR. H. H. SCHRENK presented the first paper in the symposium, "A Critical Study of the Phenoldisulphonic Acid Method for the Determination of the Oxides of Nitrogen."

In considering the oxides of nitrogen, it was stated that N_2O is not so important, but that NO_2 and N_2O_4 are really the important oxides, from the viewpoint of the industrial toxicologist. Chemical reactions were written on the blackboard showing the evolution of the oxides of nitrogen and their reaction with oxygen and water.

The phenoldisulfonic method has been in use for some time and is really an old method, having been used since 1911 in estimating the nitrates in water analyses. One can estimate either nitrates or nitrites.

In the tests made, a vacuum bottle method was used, the capacity of the bottle being 250 cc. Ammonium sulphate and hydrogen peroxide were added to the oxides and the amount of nitrogen determined as nitrates. It appeared at the outset that the results were inconsistent, there being difficulty with standard brands of nitrogen peroxide as found on the market. In the examination of the bottles, it was also found that there were certain oxides of nitrogen present, apparently formed by the sealing process. It was found possible to use a brand of hydrogen peroxide which gave no positive test and the bottle necks were also washed after sealing, which did away with the other difficulty.

These difficulties having been overcome, tests on known amounts showed the method to be of adequate precision, that it was reliable in ranges from five to 500 parts per million. Field samples confirmed these laboratory tests in which colorimeters were used.

With regard to hydrogen peroxide, it was found that approximately one-third of a fresh bottle of the peroxide was good for one year, which takes care of the usual concentrations of the oxides of nitrogen in the air.

Another important point was the necessity for the careful preparation of phenoldisulphonic acid. When the acid works as it should, the color reaction develops immediately, yellow being the positive reaction, with green shades showing a questionable reaction as to the valid properties of the acid.

DR. FREDERICK H. GOLDMAN discussed the subject "The Determination of Halogenated Hydrocarbons."

The usual method of determination is by the use of a hot absorption tube with platinum as a catalyst and the analysis of the end products. The amyl acetate method has also been used, but its validity has been questioned. In this series of tests, carbon tetrachloride was used in the evaluation methods. A special apparatus was devised (illustrations of which were demonstrated by lantern slides) and employed for the testing apparatus, taking as an example, carbon tetrachloride.

Both the Dudley and the Willson types of apparatus were compared in these tests, the chlorine being determined as silver chloride gravimetrically. The same results were obtained with concentrated and dilute solutions of sodium carbonate, and also the same results were obtained for both the Dudley and Willson solutions.

It was apparent that the Willson apparatus functions well in low concentrations and the Dudley apparatus in high concentrations.

Good results were also obtained with a volumetric method.

The sampling rate was one liter per minute for a period of 30 minutes. Two bubblers were found necessary, the first taking approximately two-thirds and the second, one-third of the sampled material. It was also found possible to devise a simpler apparatus for the purpose of collecting samples.

DR. WILLIAM R. FREDRICK discussed "The Collection, Determination, and Identification of Solvent Vapors."

It was proposed in this review of methods to consider only the commonest ones and also compare new methods

with present ideas. There are certain problems in painting and spray coating especially to be considered and also in the collection of petroleum derivatives which are mixtures and not really pure.

One may group vapors into those which are burnable and those which are non-burnable.

Specific methods are not common.

The interferometer is naturally restricted to the sampling of one vapor, although others can be eliminated sometimes. It is of interest to know that an American company is now working on the commercial production of an instrument which can be marketed for less than the foreign makes and also can be calibrated more easily, as well as checked more conveniently.

The combustible gas indicator is valuable in ranges of 100 to 250 parts per million. This instrument must be calibrated against specific vapors. The formula for the flammability of mixtures is useful here.

Only two chemical methods are in general use and these are colormetric methods for the estimation of benzol and toluol. There are certain objections to the Willson apparatus (1) the furnace burns out and has to be redesigned; (2) the absorption tube permits leaks of vapors and also must be redesigned.

It is valuable to use the sense of smell for the identification of the various mixtures of vapors; obviously the sense of smell must be cultivated and educated.

It has been found useful to examine solvent mixtures, asking the manufacturer about the formulae of them, and analyzing them by fractional distillation, as well as by other methods, although there are lots of difficulties encountered and the procedures are very time-consuming.

Identification also may be made by the boiling point, the index of refraction (use fractional distillation samples), and specific gravity is also useful.

The dropping mercury electrode appears to be promising. Instruments absorbing ultra-violet and infra-red rays have been devised, but not extensively developed.

MR. HERBERT G. DYKTOR presented the final paper on this symposium entitled "A Practical Housekeeping Program for Industry."

It should be pointed out in the beginning that housekeeping means more than order and cleanliness—it actually goes over into the field of sanitation and includes: (1) placement of men and machines; (2) provisions that there be no health hazards in the operations; (3) an easy flow of operations; (4) proper storage of materials; (5) provision for pure water supply and proper sewage disposal; (6) provision for adequate janitor service; and (7) provision for proper maintenance.

Housekeeping forms the basis of all hygiene and sanitation programs which should be found in all plants. Management must be sold on these programs by the industrial hygienist. This means contacting the safety engineer in the large plants and the employment manager in the small groups. Periodic inspections should be made with superintendents and agreements reached for the establishment of general policies; consultations should be held with the Health and Labor Departments as to working out of techniques and administrative principles.

In summary, it is concluded that a practical housekeeping program for industry is essential to efficiency of production.

Thursday Afternoon

DR. HAROLD W. WERNER discussed "The Acute Toxicity of Vapors of Several Mono-Alkyl Ethers of Ethylene Glycol."

In these studies "Cellosolve" and related compounds, such as methyl ether, butyl cellosolve, also N-propyl and isopropyl compounds were investigated and acute toxic effects observed in experimental animals, which were mice in this series of investigations.

Lantern slide demonstrations were given of the types of apparatus used.

The investigation showed that severe dyspnea is characteristic and that there is also marked hemoglobinuria. The most frequent pathological changes were observed in the spleen.

The compounds are toxic in the following order: methyl, ethyl, isopropyl, N-propyl, and butyl. The volatility is decidedly important in this connection.

In concluding, it was emphasized that these results are based only upon acute effects as observed in mice.

DR. LEROY U. GARDNER discussed "Physiological Response to Inhaled Magnesium Dust."

There are few employees subjected to the inhalation of magnesium dust because of the fire and explosion hazard involved.

Particle sizes in this investigation ranged from 1 to 100 microns, the majority being from 30 to 40 microns, with an appreciable amount under 4 microns.

Guinea pigs and cats were used as experimental animals and injections were made into the lungs and the groins. Gas bubbles were observed under the skin during the first 24 to 72 hours and then they disappeared.

In the lungs, the reaction was a subacute pneumonia which disappeared in approximately four weeks. Lantern slides of pathological sections showed collection of phagocytes in the air sac walls and also vacuoles and vacuolated cells which disappear after four weeks.

It was concluded on the basis of this investigation that there is no real practical problem in the inhalation of magnesium dust and that there is nothing of hygienic importance in this problem.

DR. DON D. IRISH discussed "Monomeric Styrene."

This compound is a simple aromatic hydrocarbon with a vapor pressure of 4.3 milligrams of mercury at 15° C. It is a clear liquid and is used for pump housing.

Experimental evidence in rats showed that at an exposure of 10,000 parts per million the rats survived in one hour but succumbed after three hours; at 2500 parts per million, the concentration can be tolerated for two hours; at 1000 parts per million, the concentration is allowable for 30 hours.

As to pathological effects, a secondary effect was observed on the liver and kidney tissue, the primary one being irritation of the lungs.

As to metabolism, the material is excreted as benzoic acid and oxidized to hippuric acid.

In summary, the primary effect of monomeric styrene is lung irritation. As to concentration, 650 parts per million are tolerated well for long periods of time, but are fairly irritating. However, the vapor possesses good warning powers on account of the odor. At 400 parts per million the odor is noticeable but tolerable, and this seems to be a good level of permissible concentration.

DR. HEDWIG S. KUHN completed the Thursday afternoon session with the paper "Industrial Eye Health Problems."

The two main problems are (1) need for a revision of visual standards, considering training, the job, and vision; and (2) a survey of employees in certain industries for the purpose of increasing visual ability in terms of efficiency on the job.

Eye protection is now universally practicable in all phases of industry and job relationships.

Three forms of examination are in use, employment examinations, periodic examinations, and survey examinations. It is desirable that these examinations include the measurement of distant and near vision with and without glasses; muscle balance; color appreciation levels; and the study of depth perception in near vision.

Job specifications must be worked out and take into consideration many factors. We must validate technique from the point of view of occupational needs, and at the present time there is in process a study of varying types of correlations.

The lantern slide demonstration showed statistics on various types of occupations.

DR. LEONARD GREENBURG, in discussing DR. KUHN'S presentation, brought out the following points: (1) we need employment examinations of a better type; (2) there must be more examinations for all types of employees; (3) there must be better illumination; (4) there must be a bigger and better campaign on the prevention of eye injuries; and

(5) there must be a wide educational campaign on the conservation of vision in industry.

Friday Morning

THE final session of the Industrial Hygiene Section was a combined meeting with the Food and Nutrition Section.

DR. FRANK G. BOUDREAU spoke on "Food and Nutrition of the Industrial Worker in Wartime."

A great deal of the material in this report has been previously published in the various reports of the Council on Foods of the American Medical Association and the Committee on Industrial Nutrition of the National Research Council.

It is apparent that we in this country are not doing as well on the subject of nutrition as Germany did at the beginning of the war. The British also have set us a good example in the installation of canteens in industry.

Sample surveys have been made on small and large groups by our various nutritional committees and have showed extensive food deficiency. A survey of 33 war plants showed the usual recent findings, such as 55% deficiency in green vegetables and some considerable deficiency in the use of milk and fruit.

A general survey of the whole nutritional situation in industry was given in general terms.

EVELYN HOLLEN discussed "Teaching Nutrition to the Families of Industrial Workers."

This report was essentially an outline of the work of the State Department of Health of Iowa. In the beginning, a leaflet on better dinner pails was printed and distributed to plant managers, followed by a leaflet on between-meal snacks. Also there was published a survey outline for the use of nurses in industry and some surveys of cafeterias, referring particularly to the eating habits of the patrons, were done.

Information has also been carried to the homemaker by conferences and demonstrations for them. Labor unions have been contacted and demonstrations and meetings have been held. Seven lessons have been prepared on the selection and preparation of foods for distribution to homemakers.

OLIVE M. WHITLOCK, R. N., spoke on the subject "The Functions of Nurses in Industry."

The object of the U. S. Public Health Service survey regarding industrial nurses was to provide factual data with respect to nursing practices in industry.

Thus far there have been completed schedules on 716 establishments, involving two million workers, and in which 2270 nurses and 500 other nursing workers were engaged.

In this survey, 34 states and the District of Columbia were involved. As to industries, the iron, aircraft, and machine tool industries have in 80% of instances employed nurses.

As to size of industry surveyed, 19% had under 500 employees; 55% had 500 to 2500 employees; and 23% had over 2500 employees. It was also found that 42% of these industrial groups had physicians on call.

As of 1941 there were approximately 6000 industrial nurses in this country, 70% of the 1900 full-time nurses having begun work in 1940-41.

The nurse in this survey has been found to do various types of service, such as taking histories; measuring vision and hearing; taking height and weight; temperatures, pulse and respiration; taking care of laboratory specimens; making house calls; and referring cases to outside physicians.

The survey disclosed that there is an opportunity in health education—only about 40% of the industries surveyed show programs of this sort.

As to safety work, 40% of the industries showed nurses as members of safety committees.

With regard to nutrition, 35% used nurses for inspection of cafeterias and 20% for advice on nutrition problems.

In 35% of the groups surveyed, the industrial nurse has clerical help for the keeping of records.

Among miscellaneous activities interestingly encountered in this survey, that are carried out by nurses, were the following: selling bonds; dispensing telephone slugs; operating telephone switchboards; assisting in secretarial work in other departments; assisting in personnel work; and doing finger-printing.

The foregoing represents a partial analysis of the data on the industrial nursing survey which is still in progress. The final report will be rendered some time during 1943 through the U. S. Public Health Service.

DR. LYMAN D. HEACOCK discussed "Improved Dental Health for Workers." In the beginning of the discussion, comments were made on lost time in industry and the control of the factors causing lost time.

The need for dental care is universal—only about one in 10 industrial plants employing workers provide any type of dental attention.

The American Dental Association has set up minimum standards and outlined services. Emphasis must now be placed on services reducing time lost and inefficiency. This involves complete dental care but emergency methods are necessary to carry out these plans efficiently. The following objectives are important: (1) provision for pre-employment and periodic examinations, (dental); and (2) provision for emergency services which include a variety of practices.

In small plants the following types of plans have been encountered: (1) several small plants have employed the full time of one man; (2) individual plants have employed the part time of an individual dentist; (3) the plant has supplied space for a private practitioner; (4) a group of plants have combined to supply a diagnostic service; (5) a mobile dental service has been provided.

The State Department of Health in most states can usually supply advice on industrial dental problems through its Dental Division.

Health education is a very important component of industrial dental services. Raising the health levels will help raise production; in this program dentistry has been frequently overlooked or neglected; good oral hygiene should be a part of an industrial health program. In this organized program, public health and dental organizations and industries schould cooperate.

THE final paper on the Industrial Hygiene Section program was given by DR. EVA DODGE on the subject "The Problem of Child Spacing in Industrial Health Programs."

Comment was made in the beginning concerning the four and a half million women presenting a problem in industry.

Maternal care can be divided into premarital care; preconception care; prenatal care; delivery care; postnatal care; and child spacing.

Frequent pregnancy and the phenomenon of fatigue in industry, combined with home duties, make special problems among women in industry. There should, therefore, be a provision for a child-spacing program for women in industry.

In 1941 the abortion rate among women workers was 22.5 per 1000 women—this will probably rise in the future on account of the difficult problems as previously indicated.

Proper information as to child spacing should be supplied in a health program in industry.

In conclusion, it was proposed that a consulting service be provided through the industrial hygiene department, which can be of great help in avoiding high mortality and consequent disability with reference to maternal problems among women industrial workers.

TARBONIS CREAM, which is a formula developed at Johns-Hopkins Hospital for the use of the pediatric and dermatalogical departments in the treatment of eczema and other forms of dermatitis, has been found to be effective both as a treatment and preventive of the very prevalent oil dermatitis and has recently been made available for that purpose. It is manufactured by DONALD MERRILL & COMPANY and is distributed on a national scale by TARBONIS COMPANY, 1220 Huron Road, Cleveland, Ohio.

American Industrial Hygiene Association

—News of Local Sections—

THE local sections of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION are organizing their meetings for 1943, with emphasis on the various phases of industrial hygiene as applied to the war effort and the production of materials used in the war industries. The New England, Pittsburgh, and St. Louis Sections have not yet scheduled their first meeting, but those interested in industrial hygiene in the respective areas should request that their names be placed on the mailing list for announcements. For the New England Section, MR. LESLIE SILVERMAN, 55 Shattuck Street, Boston, Massachusetts; for the Pittsburgh Section, DR. H. H. SCHRENK, U. S. Bureau of Mines Experiment Station, Pittsburgh; and for the St. Louis Section, MR. JOHN BUXELL, St. Louis Department of Health, Division of Industrial Hygiene, St. Louis, should be contacted.

Metropolitan New York

THE first meeting of the Metropolitan New York Section was held on October 14, 1942, at which an open round-table discussion of present and future activities of the Local Section was featured.

The second meeting, November 18, introduced DR. MORRIS B. JACOBS, Senior Chemist and member of the Fumigant Board, Department of Health, New York City, who led a discussion of chemical warfare agents and their classifications, physical effects, chemical identifications, and decontaminations. The lung irritants, vesicants, lacrimators, irritant smokes, screening smokes, and incendiaries were discussed.

The present officers of the Metropolitan New York Section are: Chairman, DR. LEONARD GOLDWATER; Vice-Chairman, ROY S. BONSIB; Secretary-Treasurer, WILLIAM J. BURKE; Councilor, two-year Term, DR. A. G. CRANCH; and Councilor, one-year Term, F. A. PATTY.

Michigan

THE Michigan Industrial Hygiene Society is planning six meetings for the current year. Five will be held in Detroit; one in Lansing. The Lansing meeting, in February, 1943, will be devoted to "Industrial Nursing" and "Women in Industry." In Detroit one session is planned on "Industrial Ventilation," featuring a prominent authority in the field, along with contributions by representatives of local industry. Another session will present "Aviation Medicine," by a Michigan physician who has interesting and valuable material for both medical and non-medical members of the Society. DR. LEROY U. GARDNER, of Saranac Laboratory, and MR. WILLIAM P. YANT, of Mine Safety Appliances Co., have accepted invitations to present their latest information at two of the 1943 meetings.

The officers of the Michigan Section for the 1942-43 year are as follows: President: STUART F. MEEK, M.D., Chrysler Corporation, Detroit; President-Elect: H. G. DYKTOR, Michigan Department of Health, Lansing; Past-President: WILLIAM R. BRADLEY, Department of Health, Detroit; Secretary-Treasurer: WILLIAM N. WITHERIDGE, Department of Health, Detroit.

The Executive Committee includes: MARY ALTON, R.N., Michigan Department of Health, Lansing; A. L. BROOKS, M.D., Fisher Body Division, General Motors Corporation, Detroit; GORDON C. HARROLD, PH.D., Chrysler Corporation, Detroit; T. F. MOONEY, Ford Motor Company, Dearborn; A. O. THALACKER, Detroit Rex Products Company, Detroit.

Chicago Section

THE first meeting of the Chicago Section, held on October 1, 1942, was on the subject "Maintenance of Industrial Hygiene Standards Under War Conditions." Four phases of this problem and what is being done about it were presented by men who are actively engaged in this endeavor. Management aspects of the problem were discussed by A. G. Hewitt, Plant Superintendent, Visking Corporation, Chicago; industrial medical aspects by LAWRENCE G. GOULD, M.D., Medical Director, Buick Motor Division, General Motors, Melrose Park, Illinois; engineering problems by WILLIAM B. LEA, PH.D., Industrial Hygiene Engineer, Division of Industrial Hygiene, Wisconsin State Department of Health, Madison; and the problems of the equipment suppliers C. A. SNYDER, Engineer Dust Control Division, American Foundry Equipment Company, Mishawaka, Indiana.

The second meeting, on the control of lead exposures under difficulties of war production, was held November 5. L. V. TAYLOR, Research Department, American Can Company, Maywood, discussed increased lead exposures due to war conditions; DR. FREDERICK W. SLOBE, speaking on the detection of excessive exposure to lead, outlined urine and blood tests and other means of determination where workers are subject to a real hazard; WARREN A. COOK, Director, Division of Industrial Hygiene and Engineering Research, Zurich Insurance Companies, presented new data on lead exposures in spray painting operations; S. M. TRUMBO, Buffalo Forge Company, Chicago, detailed the application of exhaust ventilation and control of lead dusts and fumes; and JOHN B. LITTLEFIELD, Medical Department, American Brake Shoe & Foundry Company, spoke on present practices in the control of existing lead exposures.

The subject of the third meeting on December 17 was organic solvents in present use. D. D. RUBEK, PH.D., Director, Chicago Research Division, Anderson-Prichard Oil Corporation, Chicago, discussed organic solvents being used in industry today, together with applications to which solvents, thinners and mixtures of them have been adapted. In presenting this subject, with which nearly every industrial plant is concerned these days, DR. RUBEK pointed out the manner in which mixtures of some of the less toxic solvents and thinners can be used in place of certain of the more toxic, and indicated precautionary measures which may be necessary where process requirements stipulate the utilization of some of the more toxic of these substances. Having for many years directed the activities of an able research staff in the development of applications of solvents to industrial operations, DR. RUBEK is in a most strategic position to convey information concerning these materials.

The officers of the Chicago Section for the 1942-43 year are as follows: Chairman: JAMES R. ALLAN, International Harvester Company; Vice-Chairman: JOSEPH H. CHIVERS, M.D., Crane Co.; Secretary-Treasurer: WARREN A. COOK, Zurich Insurance.

The Executive Committee includes: For three years, CLARK D. BRIDGES, Casualty Mutual Insurance Company; A. G. KAMMER, M.D., Inland Steel Company; E. G. MEITER, PH.D., Employers Mutual Liab. Ins. Co.; and ROY M. MOFFITT, Roy M. Moffitt & Company; for two years, HARVEY HENSEL, Youngstown Sheet & Tube Company; J. B. LITTLEFIELD, American Brake Shoe & Foundry Co.; T. O. MEISNER, American Can Company; and C. O. SAPPINGTON, M.D., Industrial Hygiene Consultant; and for one year EARNEST DOWNING, National Safety Council; MILTON H. KRONENBERG, M.D., Illinois State Department of Public Health; CARL LARSON, American Air Filter Company; and LESLIE STOKES, Illinois State Department of Labor.

THE *Brooklyn (New York) Eagle*, December 23: "A new occupational disease, brought on by contact with chemicals used in the fireproofing and waterproofing of cable lines, has caused the deaths of two employees of Anaconda Wire & Cable Company (Hastings-on-Hudson) and one employee of Habirshaw Cable & Wire Corporation, of Yonkers, according to DR. WILLIAM A. HOLLA, Westchester County health commissioner. Four other employees of the two companies have been stricken with the most violent form of the disease, which is usually fatal, while some 500 have been affected in a milder form. DR. HOLLA said that precautions taken at the two plants since health authorities were notified of the outbreak about six weeks ago, have apparently stopped it from spreading, so that no new cases were reported in the past two weeks. In the fatal cases death was caused by a disease of the liver, apparently induced by bodily contact with a hydrocarbon of high chlorine content."

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